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S. HRG. 103-126

**839, THE HIGH-SPEED RAIL DEVELOPMENT
ACT OF 1993, AND CURRENT INITIATIVES IN
HIGH-SPEED GROUND TRANSPORTATION**

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HEARING

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BEFORE THE

SUBCOMMITTEE ON SURFACE TRANSPORTATION
OF THE

COMMITTEE ON COMMERCE,
SCIENCE, AND TRANSPORTATION
UNITED STATES SENATE

ONE HUNDRED THIRD CONGRESS

FIRST SESSION

MAY 20, 1993

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S. 839, THE HIGH-SPEED RAIL DEVELOPMENT ACT OF 1993, AND CURRENT INITIATIVES IN HIGH-SPEED GROUND TRANSPORTATION

THURSDAY, MAY 20, 1993

**U.S. SENATE,
SUBCOMMITTEE ON SURFACE TRANSPORTATION OF THE
COMMITTEE ON COMMERCE, SCIENCE, AND TRANSPORTATION,
Washington, DC.**

The subcommittee met, pursuant to notice, at 1 p.m. in room SR-253, Russell Senate Office Building, Hon. J. James Exon (chairman of the subcommittee) presiding.

Staff members assigned to this hearing: Donald M. Itzkoff, staff counsel; and Gerri Lynn Hall, minority senior professional staff member.

OPENING STATEMENT OF SENATOR EXON

Senator EXON. The subcommittee will please come to order.

This afternoon, the Surface Transportation Subcommittee will consider the Clinton administration's high-speed rail plan, S. 839, which Senators Hollings, Lautenberg, and I have introduced at the administration's request, and certainly in addition to that, the ongoing matter of efforts to develop this promising new transportation mode.

As I said in my recent remarks in introducing the President's bill, this train has long been waiting. It has been a long time in coming, and as chairman of this subcommittee I have fought long and hard to preserve a vital role for Amtrak and to focus our attention on the potential benefits to the Nation of the high-speed rail and maglev.

Now that we have a President and an administration with real vision for the future we can turn to the difficult task of laying the American groundwork for renewed American transportation infrastructure and high-speed rail trains of the future.

I note with great interest a recent article that I read. On the front page of the magazine was the electric experiment. It says down here, "Popular Electrical News Illustrated," and a picture of a maglev train, and it is entitled "Electric Flyer Makes 500 Miles an Hour," see pages 794.

This is a real bargain, this magazine. Up in the right-hand corner it says, 15 cents. What kind of a magazine can you buy today for 15 cents? The date on the article helps explain that—March 1917.

You know, that is from World War I days, and here we are, going on a century later, finally beginning to catch up with what we should have been doing more of in the last several years. A revitalized package of rail service, both conventional and high speed, will be critical to the Nation's total transportation strategy, and certainly has a very important part to play in the vitality of the American economic policy and standing. Investment in America's passenger rail infrastructure have lagged for far too long.

Our economic competitors have moved ahead of America in high-speed rail and will continue to reap the benefits of that investment in the next century. In many crowded urban areas across the country, intercity travelers are confronted daily with jammed highways and crowded airports on top of smog and pollution. High-speed rail offers an alternative to these transportation and environmental problems.

For communities like Omaha and Lincoln, NE, for example, blessed with uncongested streets, patient drivers, and clean air, high-speed rail not only offers another travel option, it will help reduce congestion on our major American airports, making scarce landing slots available for new air service to and from Nebraska and the east coast. I only use that example because I think there are many other parts of America more rural than the urban population centers that are going to benefit directly and indirectly from this new initiative.

Increased employment in the rail sector will provide good jobs and good wages, and lessen the pressure on the railroad retirement trust fund which has been threatened, as we all know, over the years.

I say to the witnesses here today and to the American public as a whole that if we can embark aggressively but thoughtfully on this new initiative and process, we will have more and more workers supporting those people retired from the railroad industry who are in some degree of jeopardy with the problems I have outlined.

High-speed rail especially offers an opportunity to develop new, efficient, and environmentally sound technology for civilian applications. I also am highly confident that the Federal investments in high-speed passenger service will foster breakthroughs which will improve the efficiency, speed, and service in America's freight rail industry as well.

The administration's bill, S. 839, represents a solid start. For 12 years, many members of this committee and I have fought a holding action to just maintain our rail passenger service. Secretary Peña, President Clinton, and this Congress now have opened a new era, the era of American high-speed rail.

The subcommittee will review the proposed programs in detail today. Some of the questions we will consider include: what is the right level of Federal commitment to high-speed rail and maglev systems, and how can that investment be most wisely made?

Will the incremental approach to high-speed rail produce real reductions in intercity travel times, or should we concentrate our efforts on several showcase investments?

What role would the States and the communities play?

Who will operate these new services, and what are the liability issues involved in increased high-speed passenger rail service?

Where does maglev technology fit in? What is the status of the prototype program?

Mr. Chairman, your comments, please.

OPENING STATEMENT OF SENATOR HOLLINGS

Mr. CHAIRMAN. Today, the Commerce Committee will hear testimony on S. 839, the High-Speed Rail Development Act of 1993, and current initiatives in high-speed ground transportation. When I recently introduced S. 839 in the Senate by request on behalf of the President, I noted that this legislation represents a significant step toward implementation of high-speed rail in intercity corridors across the country.

As chairman of the Commerce Committee, I long have recognized the potential of and national interest in high-speed ground transportation to improve our transportation network, boost our national competitiveness, create jobs, relieve congestion in crowded metropolitan areas, mitigate the environmental impact of additional needed transportation capacity, and save energy. In both the 101st and 102nd Congresses, I introduced bills addressing the need for improved surface transportation alternatives. In 1991, the Senate passed one of these bills, S. 811, the High-Speed Ground Transportation Act of 1991, as reported by the Commerce Committee. At my insistence, key components of this balanced bill were incorporated into the Intermodal Surface Transportation Efficiency Act of 1991, commonly referred to as ISTEA.

In considering the President's high-speed rail proposal and current developments in both high-speed rail and magnetic levitation transportation, or maglev, the Committee will examine a number of specific issues, including: one, the potential improvement in rail passenger service anticipated through introduction of high-speed rail outside the Northeast Corridor on an "incremental" basis; two, the expected cost and time required for implementation of such incremental improvements in illustrative corridors; three, a review of the projected economic, labor, and competitive benefits to the United States of this Federal investment; four, an assessment of the incentives proposed under the legislation intended to encourage State, local, and private-sector investment in high-speed rail; five, the appropriate role of the National Railroad Passenger Corporation—Amtrak—in any Federal high-speed ground transportation investment program; six, issues relating to the relationship between the freight railroads and the providers of new high-speed rail services; and seven, current national needs in high-speed rail technology development, along with an assessment of the national maglev initiative and the initiation of the maglev prototype development program authorized by ISTEA.

On behalf of the Committee, I am pleased to welcome Secretary of Transportation Peña, who will testify in support of the administration's proposed high-speed rail initiative. In addition, the committee also will hear from two panels of distinguished experts and transportation leaders, representing Amtrak, the freight railroads, rail labor, high-speed rail advocates, rail equipment manufacturers, and the aerospace community.

Thank you all for being with us today, and I look forward to your testimony.

Thank you, Mr. Chairman.

Senator EXON. To testify on these and other important issues, I am very pleased to have with us today as our first witness the U.S. Secretary of Transportation who will present the administration's view in support of its high-speed rail proposal. In addition, we will hear from six distinguished panelists on two panels representing Amtrak, the freight railroads, rail labor, high-speed advocates, the aerospace community, and the equipment manufacturers. Thank you all for appearing before the subcommittee today. I look forward to your testimony.

Before I recognize you, Mr. Secretary, I would like to call upon my dear friend and colleague from the State of Nevada. I must tell you that we set this hearing at the ungodly hour of 1 p.m. in the afternoon, which is totally unheard of to start a committee hearing, only because of the schedule of my friend and colleague from Nevada. He may have to leave us, because I know he has to chair a very important hearing of a very important committee of the Senate. Senator Bryan.

OPENING STATEMENT OF SENATOR BRYAN

Senator BRYAN. Mr. Chairman, let me first acknowledge your graciousness in rescheduling this hearing so that I could be here, and to compliment you on the leadership that you have provided for passenger rail service since your tenure in the U.S. Senate and more recently the year since you have chaired this subcommittee, and to compliment Secretary Peña and the administration for once again focusing on a neglected resource in this country, and that is the ability to provide passenger service in this country for literally hundreds of thousands, if not millions of people.

In my own State of Nevada there has been an interest in high-speed rail for many years. As Governor I signed into law a bi-State commission between the State of California and Nevada the focus of which is to provide high-speed rail service from southern California to the city of Las Vegas.

There has been considerable interest within the community itself in terms of the technology of magnetic levitation, and I would simply reinforce the comments of our distinguished chairman that it is a resource that has been sadly neglected through an absence, even a hostility, of public policy to the long-term prospect of high-speed rail for passenger service.

One cannot fail to note when one goes to Europe and Japan what they have been able to do with very impressive rail systems, and as an American, I lament the fact that the early stages of magnetic levitation, the concept itself, arose here in this country when a couple of fellows got caught in a traffic jam in Boston and we lost some of the technology lead.

I am sure under your leadership, Mr. Secretary, and that of our President, and with the support of the Congress, we can regain the lead and take advantage of the opportunity to move people in an efficient, and in a manner which eases some of the congestion of some of our other passenger resources, particularly the air corridors in some of the impacted areas of our country.

Mr. Chairman, I would like to ask unanimous consent that the full text of my own comments be made a part of the record.

Senator EXON. Without objection, that is so ordered.
[The prepared statement of Senator Bryan follows:]

PREPARED STATEMENT OF SENATOR BRYAN

Mr. Chairman, thank you for holding this hearing. I support the legislation we are considering today, and commend Secretary Peña for his leadership on this important issue. I strongly support greater more public investment in high-speed rail, and I am pleased that we finally have an administration that is committed to this effort.

The need for federal assistance for high-speed rail is dramatically demonstrated by efforts in Nevada to establish a high-speed rail line.

Since 1988, Nevada and California have participated in the California-Nevada Super Speed Train Commission. The original goal of the Commission was to pursue the development of a privately built and operated super speed train between Southern California and Las Vegas.

Unfortunately, the Commission's reliance on private funding for the project has created several significant difficulties. The Commission issued an RFP, and, after receiving several proposals, named Bechtel Corporation as its franchisee. Subsequently, however, Bechtel, citing difficulties in securing private financing, dropped out of the project.

Despite these setbacks, the Commission has continued to pursue a high-speed train between Las Vegas and Southern California, and I am hopeful that the Commission will soon issue a new RFP.

The experience of the Commission has convinced me that the federal government needs to take an active role in pursuing high-speed rail. While there has long been support in Congress for such an active role, previous administrations have not been willing to commit the effort and resources necessary to move any sort of high-speed rail initiative forward.

I strongly support Secretary Peña's high-speed rail initiative, and I commend Secretary Peña for his strong leadership on this issue. I intend to work to see that the Las Vegas/Southern California corridor is designated as a federal high-speed rail corridor, and I look forward to working with the Department of Transportation to realize the Super Speed Train Commission's goal of a high-speed surface transportation link between Nevada and California.

Once again, Mr. Chairman, thank you for holding this hearing. I look forward to hearing the testimony of the witnesses.

Senator BRYAN. Once again, thank you for your courtesy in rearranging the time for this hearing.

Senator EXON. Thank you, Senator.

Mr. Secretary, I am very pleased to recognize you now, and once again to add my words of compliments to you for your leadership in this particular area. You will remember, I think, a few weeks ago when we were together on a ride up on the X-2000 from Union Station here to Baltimore and back. If I remember correctly, it was your first week in office, and former Secretary Card was there with us also. I had a good relationship with Secretary Card and I have a great relationship also with you.

I just wanted to remind you that at that time I saluted you for your enthusiastic leadership in this area particularly, and in others, and you remember at that time, when you had been in office less than a week, I chided Secretary Card by citing the train we were riding on, and said, "Mr. Secretary, it is just wonderful to have a new Secretary of Transportation that wants to be a leader in high-speed rail. Look what Secretary Peña has done for us, and he has only been in office less than a week." [Laughter.]

That is another way of saying I probably overstated the matter in a joking fashion at that time, but very seriously, I thank you for your leadership. We are looking forward to your testimony, and would ask you to proceed at this time.

I believe you do have a full written statement which is accepted as part of the record at this time. To save time, I will say that all of the other statements that have been considered and forwarded to the committee will be accepted without objection, and we will ask the following witnesses, as I am asking you now, to please summarize their statements and then we will proceed with the questions.

STATEMENT OF HON. FEDERICO PEÑA, SECRETARY, DEPARTMENT OF TRANSPORTATION; ACCOMPANIED BY MARK LINDSEY, ACTING ADMINISTRATOR, FRA, AND MARK YACHMETZ, DIRECTOR, HIGH-SPEED DEVELOPMENT

Secretary PEÑA. Thank you very much, Mr. Chairman and members of the subcommittee. If I sound a little hoarse today it is because I obviously attracted one of those nuisances that is going around Washington, DC these days.

Let me first of all, Mr. Chairman, congratulate you and thank you for your leadership in this area, and I do remember the trip that I took with you on the X-2000.

Not only did you make that very gracious comment, which put me in a little difficulty as respects the past Secretary, but we also observed the X-2000 we were experimenting with was not American-made. In fact the tilt-train technology had also been developed by Americans years ago, but because we were not able as a Government to work in partnership with those inventors, the systems were subsequently developed in Europe.

So, I am happy to be here today, with a couple of FRA gentlemen. To my right and to your left is Mr. Mark Lindsey, who is the Acting Administrator, FRA, and Mark Yachmetz, who is the Director of the high-speed staff in the Department.

I am going to be brief, Mr. Chairman and members, because you already have my testimony, but let me just lay out the general framework here.

I am very excited to be presenting this new initiative to this committee. I believe it is a bold step and sets a new direction for our country. You stated, Mr. Chairman, already, the very positive impacts that this new technology can have on our country—and let me just put that in a little more perspective by giving you a few statistics.

In 1991, our Nation's 36 million business travelers took nearly 151 million business trips of 100 miles or longer. Domestic pleasure travel in 1991 involved over 1 billion trips of over 100 miles. In addition, 43 million foreign tourists visited the United States in 1991, so we can begin to conceptualize how we can provide other transportation opportunities in all of these areas.

The vision that we bring with this initiative is very straightforward. First of all, let me assure you that the high-speed rail initiative is not a panacea and will not solve all of our transportation problems, but it will be seen as part of an integrated national transportation system, one that works very nicely with our airports, with the automobile, and with other modes of transportation in our country. It is a very important component of that national transportation system, which we believe is safe, it is fast, and it is efficient.

We think it is particularly appropriate in connections between cities that are between 100 and 500 miles apart, and equally importantly we think it will be used and be applied in a way that will be environmentally positive, particularly in areas, for example, like southern California and other parts of the country which have significant air pollution problems. So that is our general vision and contemplation of how the high-speed rail initiative will work.

Let me just walk through the outline of the program very briefly. The total high-speed rail maglev initiative is \$1.3 billion over a 5-year period.

The first element of the high-speed rail part of the program is a commitment—at least we are proposing—to invest \$982 million in 5 years in a number of corridors throughout the country, and what is key about this investment is that we want the investment to be made in partnership with cities, with States, and the private sector.

We believe that this \$1.3 billion initial investment can be leveraged to as much as \$3 billion and perhaps more. The reason we cannot say that specifically today is because we have not yet seen official proposals being submitted to us, but you will recall that last year, even during a time when the past administration was not particularly supportive of this technology, there was great interest around the country. The Department of Transportation was asked to identify corridors, and it identified five last year, based upon that approach by the past administration.

We believe that with the much more constructive philosophy that this administration brings to the country that the amount of excitement and the number of possibilities throughout the country will expand significantly.

The first point I want to make is this, because I have been asked this question by a number of people. As respects the continued eligibility of the five corridors that were identified last year, all this legislation requires is that the Governors of those States simply indicate that they would like those corridors to be placed on a "final list" of corridors.

Equally important, Mr. Chairman, is the fact that we will open up possibilities for other communities throughout the country, because since this announcement we have seen tremendous excitement and lots of interest on the part of communities who now want to be identified as a potential corridor.

So, we will open up that possibility, and then as a matter of process we will go through all of those proposals and identify the final corridors which we think are most appropriate following some criteria which are outlined in the legislation.

A second part of this proposal is lifting the current limitations on tax-free bonds that are an impediment to encouraging private investment in high-speed rail. There is another bill pending in the Congress which would take away that impediment. We think that is another way of leveraging limited dollars.

The other point I want to make is that there have been questions asked of me about the relationship of this bill to the Northeast Corridor. The Northeast Corridor will be funded through a separate process, and so this initiative primarily addresses needs outside of the Northeast Corridor.

The second aspect of the initiative we have before you is what we call the technology piece of the high-speed rail initiative. That is a commitment—at least we are proposing this—of \$300 million over a 5-year period to support new technology.

Mr. Chairman, you mentioned the whole area of magnetic levitation, and I did not realize the article you were holding up was so old. I knew this discussion had been going on for many years, but clearly we are behind the rest of the world.

Hopefully, with this piece of the high-speed rail initiative, we will encourage not only States and cities but more importantly the private sector to begin to look more seriously at the magnetic levitation technology, and so we think this technology initiative will at least offer that promise to the private sector.

Let me conclude my comments, Mr. Chairman, because I know you prefer to ask some questions, by saying that we believe this initiative will be a new effort on the part of our country to offer new transportation alternatives for the country.

Since I come from the local government perspective, let me say that one thing we do not want to do with this initiative is to create a new program of complicated regulations and processes which will make it very difficult for communities to participate in this program. Our goal is, with your strong support and the support of the Congress, to have this legislation passed as quickly as possible, so we can set up a very effective and efficient process for people to participate so that we can begin to fund high-speed rail corridors in the 1994 fiscal year period. That is our goal, and we would love to be present with you, Mr. Chairman, and Senator Bryan in a few years as we ride together the first new high-speed rail train somewhere in our country.

Thank you very much.

[The prepared statement of Secretary Peña follows:]

PREPARED STATEMENT OF FEDERICO F. PEÑA

Mr. Chairman, distinguished members of the Committee, it is my privilege to appear before this Subcommittee to discuss the Clinton Administration's proposal to make high-speed rail transportation a part of this Nation's intermodal transportation system.

I know that many people will ask themselves why, when we already provide support to a variety of transportation modes, should we create a new program that commits to new Federal outlays over the next several years?

The answer to that question goes to the mission of the Department of Transportation. In establishing the Department in 1966, the Congress declared that the general welfare, the economic growth and the stability of the Nation require development of national transportation policies and programs conducive to the provision of fast, safe, efficient and convenient transportation.

What Congress recognized in 1966, and what is brought home to the Department every day, is that fast, safe, efficient and convenient intercity transportation is inseparable from the health of our economy and the general welfare of our country. In our dispersed economic system, people must travel between cities to transact business, to negotiate deals, to purchase goods, and simply to visit others. It is clear that, as the economy grows, the demand for intercity travel will also grow. Conversely, the lack of a fast, safe, efficient and convenient intercity transportation capability will serve as a hindrance to economic growth.

As we look to the future, will our intercity transportation system support economic growth and America's international competitiveness in the next century, or will it become a millstone around the economy's neck?

The history of intercity transportation in the United States is a history of change. Evolving priorities, technological innovation, and Federal and State government ac-

tivity have periodically remade the face of the Nation's transportation system, and with it the very character of the Nation itself.

The Clinton Administration has recognized that a new era is opening where new technologies and new priorities will once again remake the face of American transportation. A major part of the Administration's vision is that this renewal of the Nation's transportation system must include intercity high-speed rail transportation. Before getting into the specifics of our proposal, I wish to share with you that vision of high-speed rail—why it is part of our plan to rebuild America.

High-speed rail is not a cure for all of our intercity transportation needs. But it fits into an intermodal approach that meets our transportation needs. High-speed rail is an extremely safe, fast and efficient means of moving large numbers of people between cities that are between 100 and 500 miles apart. In addition, high-speed rail can provide service to intermediate points and, in urban and suburban areas, its infrastructure can be shared with commuter type service. In selected intercity corridors with a high density of travel, high-speed rail will provide an effective alternative means of transportation that provides superior access to the urban economic centers.

High-speed rail can have substantial public benefits as well, such as improving air quality and reducing dependence on imported petroleum. In areas that have difficulty with air quality, such as southern California, high-speed rail may be able to increase capacity to match growing populations while helping attain air quality goals at reasonable cost.

Another important part of our vision of high-speed rail in the United States is that American industries will become beneficiaries of the opportunities for the design, development, manufacture and deployment of high-speed rail technologies. The development of high-speed rail can help fuel economic expansion. And, while many of the companies participating in the development of high-speed rail will be traditional railroad suppliers, there will be new opportunities for re-focusing traditional defense industries into civilian pursuits.

High-speed rail will be the first new transportation initiative of the intermodal era. Our vision of high-speed rail is of a component of an integrated intercity transportation system that includes aviation, highways, and high-speed rail in complementary roles. Each will serve where the particular technology is most efficient in meeting the Nation's priorities. The overall national transportation system is one in which intercity modes of transportation are efficiently connected to each other and to intra-city systems.

This integration of high-speed rail into the total transportation system substantially leverages its potential. The cities being served by high-speed rail will benefit from the concentration of economic growth. Over time, urban terminals for high-speed rail operations may attract commercial activities that seek to take advantage of the superior access afforded by high-speed rail. In addition, such high-speed rail operations could also lead to increases in tourism and other discretionary travel to the city centers.

An excellent example of what high-speed rail can mean to an older downtown section of a city is just a few blocks away at Washington's Union Station. That station anchors the south end of our only rail system that provides high-speed service. The revival of Union Station as a modern multimodal terminal, linked directly into the Metro system, has been the catalyst of privately financed urban redevelopment that radiates several blocks from the station.

High-speed rail may assist in reducing pressures on certain very congested parts of the air system, releasing capacity for more efficient, longer-haul flights. High-speed rail service can be competitive in terms of time and price with short haul air service. Moreover, when the time and cost of access to and from terminals are added, high-speed rail will be faster and cheaper for some categories of trips. Where good connections with airports are possible, high-speed rail can assume a role as a regional and local feeder and distributor of airline passengers.

Successful high-speed rail systems must also be fully integrated with intercity bus and intra-city rail, local bus and transit systems, and nearby highways, which would all feed the high-speed rail system. Intercity travel by common carrier will become relatively seamless from the traveler's perspective.

Diversions to high-speed rail from short haul air service in some corridors could free scarce airport capacity which could then be used by the airlines for the more profitable longer hauls. This, in turn, may help eliminate the need for costly investments in the aviation system.

High-speed rail may also help address highway congestion by diverting a portion of highway trips. Surveys of passengers on Amtrak's existing service indicate that between 45 percent and 65 percent of intercity rail passengers would have used automobiles if the rail service had not been available.

The great potential for high-speed rail has been recognized for some time. The question has always been what can we do to realize that potential. I have shown you our vision, now I will briefly outline the Clinton Administration's plan to permit this Nation to realize the potential of high-speed rail.

THE PRESIDENT'S HIGH-SPEED GROUND TRANSPORTATION INITIATIVE

It is clear from recent experience that high-speed rail will not develop in this country without some investment of Federal financial resources. The Administration proposes a program of Federal investment in high-speed rail. We expect over the next five years to request approximately \$1.3 billion in budget resources for all aspects of this program.

The challenge for the Department and Congress is to craft a program that promotes development of high-speed rail in those corridors where it offers an efficient transportation option. Such a program must focus on realities. How do the transportation modes perform in comparative terms of technology and economics? What are the costs and benefits of potential projects? And based on this hard look, where should high-speed rail be developed? We want to treat these projects as national investments and investments that will have the real potential for paying national dividends.

The program must use Federal resources as a source of leverage to encourage the States and local governments and the private sector to develop the technologies and build the systems necessary to make high-speed rail a reality. The challenge of making high speed rail a reality in the U.S. will be met through financial assistance for corridor development, technology development and applied research in support of high-speed ground transportation.

Financial Assistance for High-Speed Rail Corridor Development: The first element of the President's Initiative is Federal investment in the development of high-speed rail systems in specific intercity corridors.

For the first time the Administration proposes to establish a separate program of Federal financial support to the States and local governments to assist the implementation of high-speed rail systems outside the Northeast Corridor. As with aviation, highways and transit, the new program will be a partnership among the Federal, State and local governments. The Administration proposes to fund completion of the Northeast Corridor Improvement Project separately, bringing high-speed rail service throughout the main line corridor between Washington, D.C., and Boston, and therefore the Northeast Corridor is not made eligible for the new program. A separate authorization of appropriations for the Northeast Corridor project is contained in our bill, now introduced as S. 5839 in the Senate.

In the short term, the initiative will primarily support ongoing efforts to achieve high-speed service through incremental improvements to existing infrastructure. The initiative will also lay the groundwork for implementation of very high-speed service on new infrastructure in appropriate markets.

The program will harness the energy, know-how and financial resources of the private sector to improve intercity transportation. To accomplish this goal, the Administration proposes elimination of the current limitations on the use of tax-exempt bonds to encourage private investment in high-speed rail.

The new financial assistance program that will aid development of high-speed rail outside the Northeast Corridor will leverage private investment and State and local matching funds. In addition, States and local governments will be encouraged to use those aspects of existing transportation programs that can be used to support high-speed rail development. By integrating corridor development into state-wide transportation plans and crafting programs that take advantage of all these opportunities, the impact of the proposed Federal investment under the program of approximately \$1 billion over the next five years can be dramatically expanded.

The key link in the program will be between the Department and the States and local governments. The Department will look to the States and localities to undertake the necessary planning and feasibility analysis. Based upon that analysis, a State or States may propose to implement high-speed rail service in a specific intercity corridor. The Department will work with designated public agencies to develop the plans and financing necessary to implement the proposed service. The commitment of State and local governments to a project will be a strong indicator of the project's prospects for success.

We support the fundamental precept, expressed in other federal capital investment programs, that opportunities for U.S. products and a diversity of businesses to play a strong role in the program should be ensured. This is addressed in part by nondiscrimination provisions already contained in the "4R" Act. However, a primary purpose of the President's initiative is to place the United States in the fore-

front of high-speed passenger rail technology. Therefore, we are working on legislative provisions to assure U.S. business participation, across the spectrum in size and ownership, that adapt the best provisions of this type currently applicable to Federal financial assistance. One important issue is aligning our language appropriately with the others in related highway and transit law. Our proposals will be forwarded to Congress as soon as possible. It is most important to have the appropriate legislative language advocating reliance on U.S. technology, products, and businesses included in this particular piece of legislation.

Technology Development: The second element of the President's initiative is the development and demonstration of new high-speed technologies to provide increased options for transportation decision makers, to improve the economics of high-speed ground transportation and to enhance the competitiveness of U.S. industry in the transportation market place. The Administration proposes to spend approximately \$300 million in this area over the next five years.

The initiative will support development of technologies that will aid the implementation of high-speed rail service on existing rail infrastructure, thereby permitting us to take advantage of this valuable and under-utilized national resource. Development of a high-speed non-electric locomotive is a good example of the work to be undertaken. The budget request includes \$15 million for this work in FY 1994 out of a total of \$75 million over five years. For FY 1994, \$5 million for this work is requested from the Highway Trust Fund under section 1036(c) and section 1036(d)(1)(B) of ISTEA. The remaining \$10 million is sought from general funds.

The other thrust of the technology development portion of the President's initiative is design of an advanced U.S. maglev system superior to the technologies being developed overseas. This element of the initiative looks ahead, anticipating the Nation's future needs for high-speed ground transportation and investing prudently to meet them. For this work, the budget request includes \$29 million for FY 1994 out of a five year total of \$228 million under sections 1036(a) and 1036(d)(1)(A) of ISTEA.

The prototype development program that the Administration proposes follows the outline of the program authorized in ISTEA, but proposes modifications to recognize the complexities involved in developing new technologies and the significant concerns expressed by some over the ultimate feasibility of this technology. Accordingly, the FY 1994 budget request would fund only three contractors for phase I of the maglev prototype development program rather than five or more contractors as called for in ISTEA. The budget request also reflects the Administration's view that phase I should be stretched out from 12 months to 18 months to lessen the technical risk of the program. Similarly, the Administration's proposal would drop the number of contractors funded for phase II of the maglev prototype development effort to a maximum of two and stretch out phase II from 18 months to 30 months, also to reduce technical risk. With fewer contractors in each phase, we hope to have stronger teams of competitors as well as a less costly program. The amounts to be devoted to each contract would remain the same as we infer were contemplated by the drafters of ISTEA. Extending the deadlines is intended to give contractors enough time to develop well-thought-out designs and, in phase II, to test at least some components so as to better assure that the final design will work as intended.

Over the last several years, the Department has developed a close and effective working relationship with the U.S. Army Corps of Engineers in the evaluation of maglev technology. We expect to continue this close relationship as we move forward with this program.

We also propose to reevaluate the maglev prototype development program at the end of 1994. ISTEA provides for a commercial feasibility study to be completed in two years. We plan to complete that study by the end of 1994 and would not proceed if the results of the commercial feasibility study are not favorable.

Applied Research: Finally, the Administration's initiative includes an applied research element. In this effort, the initiative will be addressing such issues as the incorporation of recent advances in science, such as composite materials or high temperature superconductivity into the designs of high-speed rail systems. This research will be designed to keep American industry at the cutting edge of this aspect of transportation technology.

CONCLUSION

Fast, safe, efficient and convenient intercity travel is essential to the health of our economy and the general welfare of our country. Growing transportation demand and the inability of existing transportation programs to meet this demand in a way that minimizes negative impact on our environment and on our people has led to

the point where, once again, the Nation's transportation system must evolve beyond its present capabilities.

It is the mission of the Department of Transportation to stimulate research, encourage technological development and support investments that will incorporate into the Nation's transportation system those emerging systems that best meet the Nation's changing priorities. And this will now include advanced high-speed ground transportation.

I am pleased to say that following transmittal of our proposal last month and hearings held in the House, the Energy and Commerce Committee is actively preparing legislation that we expect will incorporate this vision for a new transportation system. I hope to work closely with your Committee to make this vision a reality.

Mr. Chairman, this concludes my prepared remarks. I will be happy to answer questions from you or the members of the Subcommittee.

Senator EXON. Mr. Secretary, thank you for your concise statement. This is an exciting new proposition we are launching today.

First, with regard to the \$1.3 billion high-speed proposal, this is part, as I understand it, of the overall administration's investment package. However, I understand that the present fiscal year 1994 budget requests, including the investment package, exceed the budget resolution agreement by several billions of dollars.

How do you assess the administration's support for this new high-speed program relative to the funding needs of other existing transportation programs given the recognition that you and I and others have of the budget constraints?

Secretary PEÑA. Mr. Chairman, we all recall that several months ago, then Governor Clinton spoke eloquently and I think from the perspective of a visionary about our country having a high-speed rail system in corridors around the country.

Since that time, President Clinton and Vice President Gore have been very supportive of this effort. We have been working with the Vice President in particular in putting this initiative together. And I believe we have strong support of the administration.

Senator EXON. Thank you, Mr. Peña. I am going to reserve the balance of my questions now and yield to Senator Bryan for any questions that he has since I know that he has to leave very shortly.

Senator Bryan.

Senator BRYAN. Mr. Chairman, thank you very much. One aspect of this, Mr. Secretary, that I particularly welcome is this public/private sector partnership that you have envisioned. It is clear that without it, the potential is not going to be realized.

The legislation that I briefly alluded to in my opening comment contemplated 100-percent private sector participation. In a perfect world, that would be desirable. But the reality is it is simply not going to come about without some type of public nurturing and support.

Share with me, if you will, what type of public/private sector partnership or relationships you anticipate in terms of working on the technology piece of this?

Secretary PEÑA. Senator, to some extent we have not yet seen the full range of the possible relationships that might occur. But let me talk about that from the information that we currently have.

What we are proposing is that in a particular corridor, our program would fund up to 50 percent of the total cost of the complete corridor. And I want to emphasize that. If one looks at discrete

parts of a program within a corridor, we are proposing that we would be willing to fund up to 80 percent, 20 percent matched by the States, but for a very specific, discrete part.

The role of the private sector here is absolutely key. One of the criteria that we will apply in looking at these proposals around the country is the extent to which there is local support, both on the part of local, State, city governments, but also the private sector.

I met a couple of months ago with Governor Miller to talk about his interest here. And his view was that their program came very close to becoming operational but for the fact that there was no Federal commitment at all. So, we are hopeful that with relatively small amounts of money from the Federal Government, we can spur and encourage those kinds of very exciting and creative partnerships that you brought into being several years ago.

Senator BRYAN. In terms of the technology—the maglev obviously is one, the tilt train that we all rode is the other—I mean, do you make any prejudgments as to the type of technology that you are interested in working with? Or is that an open-ended proposition subject to the specifics of the proposal?

Secretary PEÑA. Generally speaking, Senator, it is an open-ended proposition. I suppose the one criteria we would look at is speed. Clearly, we would like to see high-speed rail corridors. Obviously in the area of magnetic levitation, that would not be a question.

But no, we have not focused on one particular technology.

Senator BRYAN. The reason why I asked that is because, as you know, there are some limitations based upon technology as you use, in effect, the existing rail beds, even slightly modified. There are some finite limitations if you are going to, you know, a maglev system.

Obviously, the range of what you can do in terms of speed is much greater. The cost obviously is much greater. The system that we rode up on permits adaptation to the existing rail bed in this country and that is obviously attractive from a fiscal point of view. It is less attractive from a technology breakthrough in terms of accelerated speed.

Secretary PEÑA. That is correct, Senator. And that is why we have proposed the initiative as we have, focusing the \$982 million primarily on the corridor improvement effort and limiting the \$300 million to the new technology area.

We know that there are many people who still question the viability of magnetic levitation. But we do not want to close that door today. We want to continue to experiment, to pursue it, to analyze it incrementally, so that at the point that we all have a high comfort level about its cost benefit and some of the other questions that have been raised, that we can also be supportive of that technology. So, those are open-ended questions at the moment.

Senator BRYAN. Let me just conclude by saying that we obviously look forward to working with you. I support the legislation and you will have an application on your desk in due time for the appropriate designation, as you might well imagine, for one of these corridors.

Mr. Chairman, I thank you for allowing me to take some questions out of order.

Senator EXON. Senator Bryan, thank you very much. I salute you for your leadership as Governor and your leadership here in moving ahead this program that I think is going to pay big benefits for America in the future.

Mr. Secretary, you indicated that you had not seen that wonderful article from 1917, in the *Electrical Experimenter*. Not only is there an article on it, but here is an artist's conception, way back then, of a maglev train that is not significantly different from what we are talking about today.

I think that two quotes from this article will supply you with ideas I find fascinating. The first paragraph states that:

An electric railway over which cars will fly in an astounding speed of 500 miles per hour or at the rate of 8.3 miles per minute is one of the scientific possibilities of the day and one which is engrossing some of the master engineering minds of two continents.

And the last paragraph is perhaps particularly instructive. It says: "while the hypothesis and ideals of Professor Weinberg"—who was the inventor of this—"as previously outlined, not to mention those of the numerous other investors and scientists, have often been rudely shattered by the more level headed and slow going intellects of the day. It really does not seem so rankly impractical to conjecture on the possibility of such a high speed railway somewhat of the type herein described. A fortune awaits the man who is big enough for the job." They should have said man or woman, but they did not do that in those days. "It wants another Tesla or Edison and he is bound to arrive sooner or later."

I just think it is fascinating that we are sitting here today talking about something that we overlooked all this time and those people were so far ahead back in 1917 on a project that we are finally getting around to, at least to consider, in these "modern days."

Mr. Secretary, I understand the desire to encourage interest in high-speed rail. Some of the questions that I ask come from a devil's advocate standpoint, because I think they are questions that have to be addressed. They are certainly not intended on the part of the chairman to play down this possibility.

Yet there are a lot of questions that we are going to have to address in committee and on the floor of the U.S. Senate in moving ahead on this. And I think some of these issues should be laid out.

I understand the desire to encourage interest in high-speed rail in as many communities as possible. Yet, if we spread the proposed corridor funding around in more than two or three corridors, it may take a long time indeed before we see even 125-mile-per-hour service anywhere outside the Northeast.

The questions then are many, and I know you cannot respond to all of them in detail. But how will the DOT make the difficult decisions on which corridors would receive funding?

The GAO points out that the legislation does not limit the number of projects that could receive Federal funding, nor does it require a schedule for actually bringing a high-speed ground transportation system on line.

What are your thoughts on these and other related issues that are bound to come up?

Secretary PEÑA. They are very good questions, Mr. Chairman. Let me first address the first one.

Generally speaking, I support the notion that we cannot fund every project. And generally speaking, I support the concept that, if we spread the limited dollars too thinly among many projects, we will not see any project become a reality in a short period of time.

Having said that, today I am not prepared to say that it is going to be two or three corridors, for this reason. I believe that, given the new and very strong message that we send today with this initiative, that we will see new creative partnerships and commitments that perhaps we had not contemplated in past years.

Think of this. Even with the very negative attitude that we saw in the past administration, we still saw this initiative, for example, in Nevada and California and in the other parts of the country last year. Imagine what the possibilities are now that people know there is an administration working in concert with the Congress to be supportive of many of these projects around the country.

That is a long way of saying that in some cases for example, I would not be surprised to see "overmatching" on the part of States and localities. They have done this in other projects in the area of transportation, where a State will say, "We understand that you are asking for a 20-percent contribution. We are here to make a 40-percent contribution." That is how strongly we want to form a partnership with the Federal Government.

So, I think we need to wait until all the proposals are in before we start prejudging whether it is two or three. We are still hopeful that the \$1.3 billion can be leveraged into multibillion dollars across the country. I think right now it is only up to our imagination to guess the extent to which we will see those very creative partnerships.

Senator EXON. What you are saying, Mr. Secretary, is that the \$1.3 billion could be seed money which could grow immeasurably as the interest in this continues to mushroom as it seems to be doing. Is that right?

Secretary PENA. That is my view, Mr. Chairman. For example, I have had discussions with regional entities which have started to form multi-State compacts, much like the Nevada/California proposal. They are now saying, because there is a commitment at the Federal level, that they want to work with other States to package their resources together.

So, I think we ought to keep that door open and wait to see how many of these creative partnerships will be made by way of proposals to us.

Senator EXON. Mr. Secretary, one of the best kept secrets or least known activities of the recent visit of the Japanese Prime Minister here in April, is that at that time, Prime Minister Miyazawa of Japan apparently presented to the President a memorandum of understanding on the joint development of maglev and high-speed rail technologies. So, this is moving internationally as well.

A DOT spokesman has been quoted as saying, "we anticipate maglev will be the first project agreement." Now, is that true? Is that your feeling as well? Does the administration plan to sign such an agreement? And if so, how soon? If such an agreement is

signed, what impact will this have on the future viability of the U.S. maglev program contained in ISTEA?

In addition, please tell us about what you know of the May 27 conference—May 27 this year—on United States-Japan cooperation in transportation, which will focus on high-speed rail?

Another concern that I think some have is that if we are going ahead with this, how do we answer the question that is being asked: Would DOT's participation in such a program with the Japanese at least give the impression that our Federal Government is cooperating with the Japanese, possibly at the expense of U.S. companies and U.S. jobs?

Secretary PEÑA. Mr. Chairman, first of all, let me say that I am not aware of the quote that you are referring to. But let me say this. The Secretary of Transportation has made no commitments to any government about any proposal.

I have been advised that sometime in 1992, I believe the Department of Transportation had some conversations with engineers and others in Japan to talk about their magnetic levitation programs. I am not aware of any formal agreements that were reached as a result of those discussions.

There is a conference on May 27, which I was invited to attend to talk about what we are doing in the area of magnetic levitation. But at this point, I am not aware of any agreement that has been signed with anybody. And at this point, I do not think we are in the position of signing any such agreement.

But let me, with your indulgence, turn to some people who perhaps were involved in 1992 who might be able to give us a little more history on that.

Senator EXON. Yes, I would like to know a little bit more, if you know any of the specifics of where this conference on May 27 will be and if you know what it likely to be discussed or if we are going into in that particular conference?

Mr. LINDSEY. I can address a part of it, and Mr. Yachmetz can address another part. I believe the 1992 contacts were on a safety basis.

We have been looking at the safety of magnetic levitated vehicles generally, in our Office of Safety, and we have certainly been looking intensively at the German Transrapid system. I believe some of our engineers went and looked at the Japanese system as well, as we have done over a period of time, during their development of that system. It is quite different than the German one. We want to be sure that we understand both approaches thoroughly.

Mr. Yachmetz, if you would address the conference.

Secretary PEÑA. But let me interrupt. There was no document signed, or any agreement signed with anybody?

Mr. LINDSEY. No, none that I am aware of at all.

Mr. YACHMETZ. And another area during 1992, as the committee is aware, we were undertaking the national maglev initiative, in which the broad range of options were assessed as part of an effort to come up with an administration proposal of how to pursue maglev. And so, the options ranged from doing nothing to building a U.S. maglev prototype, to some sort of joint arrangement. And there were discussions to see whether there was interest on the part of other parties, but not from a standpoint of making commit-

ments, but just exploring all the options so that we could provide that information to the decision makers in the administration.

With regard to the conference, the Japanese Ambassador has set up this conference to explore the opportunities for government-to-government and business-to-business partnerships, in the development of a wide range of technologies. This specific conference is in the high-speed rail area. And it is the first conference in which, I think, issues will be explored, ideas will be explored, so we are very, very far away from a standpoint that there would be an agreement.

Secretary PEÑA. Mr. Chairman, let me respond to the second part of your question, and that is the notion of developing U.S. technology.

One of the results of this initiative, that we would like to see, is the support of U.S. industry in this area. When I visited the Department of Transportation's test track facility in Pueblo, CO, a few months ago, I learned that about 15 years ago or so, probably 17 years ago, the test track facility actually started a magnetic levitation project. But then it was defunded by the Federal Government and, of course, since then the technology went to Germany and Japan.

We do not want that to happen again. I would like to find a way to use this initiative, to use the resources which I think we can garner throughout the country on the part of both the private sector and the States, to support U.S. technology in this area, to the extent that someday we could be the exporters of these new high technologies. That is my direction. I think that there are some very creative relationships that we can establish; for example, with a number of transit agencies around the country, to work together in a thoughtful way to try to be more supportive of U.S. industry, so that they know there is a long-term product commitment that will justify a significant investment by U.S. corporations in this arena. That is the direction that we want to head in.

Senator EXON. Mr. Secretary, thank you very much for that response. Let me ask, without taking a great deal of time, if one of your experts could just briefly explain for the record: What is the essential difference, and I think there are some differences, between the maglev system that has been developed in Europe and the one developed by the Japanese? I remember reading about this previously.

As I remember the article, the space between the rail and the maglev vehicle I believe was wider in Japan, and less in Europe. But other than that, are there any significant differences between the advancements that the Japanese have made and what the Europeans have done? And what are the differences, could you explain it in layman's terms?

Mr. YACHMETZ. Since I am almost a layman, I will try to. There are some very significant differences. In fact, it is as different as repulsion and attraction. The German system uses the magnetic principles of controlled attraction between opposite poles, and the Japanese system uses the principle of repulsion of like poles of magnets.

The German system is the one with the smaller gap; it has a three-eighths inch of a gap. The Japanese system has about a 4-

inch gap. A lot of the difference in the levitation has to do with the Japanese system's incorporating superconducting magnets.

And the other basic differences between the systems are that the German system is a little bit ahead of the Japanese system in terms of development. That the German system is, in fact, being currently marketed for application, although nobody has yet started construction of a commercial line; whereas the Japanese are currently developing a more advanced test track, and I think they are looking at sometime around the turn of the century before they are ready for commercial application.

Senator EXON. So, it is safe to say that, at this time there are no state-of-the-art definitions which have been agreed upon about what and exactly how, the mechanics of magnetic levitation would be applied; and that is where you see an opening, Mr. Secretary, for American technology to come into play. Is that right?

Secretary PEÑA. Absolutely, Mr. Chairman. And another aspect of this is improving systems that exist. For example, neither of those systems have the tilt provision, which allows additional advantage. So that would be an addition that, certainly, a U.S. firm could add to this technology.

Senator EXON. Mr. Secretary, I have one last question, and since I appreciate the constraints of your time, we will then excuse you.

Let me ask you this question on something that is going to come up later on in the hearing: Mr. Harper, of the Association of American Railroads, will testify that unless the liability concerns of the freight railroads are addressed, the freight industry will be unable to participate in high-speed corridor development. What is your view on this issue, and what is the rationale that could be applied to solve it?

Secretary PEÑA. Mr. Chairman, that is a very difficult question. However, we did observe that Amtrak just 3 months ago was able to reach agreement with some of the freight rail lines, in addressing the liability question. We do not have an answer, or at least a DOT position on that.

We would hope that those issues can be resolved in each of the corridors, depending on the relationships that are established, for example, between that particular State and that particular rail line in that area. And it could be that some of these improvements can be used to benefit the freight line in some fashion, and that, perhaps, some creative partnerships can be developed there.

So, we do not have a final position on that issue, and we hope that those issues can be resolved at the community level.

Senator EXON. Mr. Secretary, thank you. There will be additional questions for the record for you.

And since we want to move this along and get this measure passed as soon as possible, if you could respond as quickly as possible to other questions from the Chair and possibly other members of the committee, we will appreciate it very much.

With that, before you leave I would like to have you pick up a copy of this 1917 article that you have not read. I think you will find it fascinating reading. Again, thank you for your leadership and thank you for being here today. Without objection, the article that we have referenced from the Electrical Experimenter magazine of March 1917, is herewith published in the record.

[The information referred to follows:]

(The Electrical Experimenter, March 1917)

**ELECTRIC-FLYER MAKES 500 MILES AN HOUR—TRAVELING AT 500 MILES PER HOUR
IN THE FUTURE ELECTRIC RAILWAY**

An electric railway over which cars will fly at the astonishing speed of 500 miles per hour, or at the rate of 8.3 miles per minute, is one of the scientific possibilities of the day and one which is engrossing some of the master engineering minds of two continents.

An electric railway having such possibilities was broached by Professor Boris Petrovik Weinberg, instructor in Mechanical Engineering at the Imperial University of Petrograd, Russia, at the recent New York meeting of the American Association for the Advancement of Science. Professor Weinberg has even built a model of his proposed 500 mile per hour electric railway; but the first difficulty met with in considering his really remarkable invention is that the cars are supposed to be shot thru a tube in which there is created a partial vacuum.

It would seem quite prohibitive, at least with our present understanding of such engineering matters, to build even a relatively small railway of this type and capable of maintaining such a speed as 500 miles per hour where the cars would have to pass thru an evacuated tube or tunnel, even if this were divided into short sections or locks, so as to reduce the total quantity of air that would have to be pumped out of the tunnel at a given instant. If we had available today a system extending from New York to San Francisco and on which the cars traveled at the rate of 500 miles per hour, then the trip between the great Metropolis of the East and the Golden Gate could be made in five hours. In other words one could breakfast in New York and lunch in Frisco!

Many other remarkable possibilities of such a railway system will immediately suggest themselves to the reader.

The editors of this journal have evolved a system for ultra high speed railway locomotion, such as 500 miles per hour, and which has been portrayed vividly by the well-known artist, Mr. George Wall, on our front cover. This system does not involve any such hyper-scientific proposition as that requiring an evacuated tube thru which the cars are to pass, but, instead, brings into play the rather slightly known method of eliminating friction by electromagnetic levitation, on the principle developed to some extent a few years ago by one Emile Bachelet, formerly of Mt. Vernon, N.Y., but now engaged in research work in England.

The underlying principle of electro-magnetic levitation, as followed out by the Bachelet floating railway system, is readily understood by referring to Fig. 1 herewith. Here we have an electro-magnet coil M and an aluminum ring R. Now, if we pass an alternating (rapidly changing from positive to negative and vice versa) current thru the magnet coil, it will produce, in turn, an alternating or constantly changing magnetic field. Such a field will repel sheets or rings of copper or aluminum, owing to flee eddy currents which are set up in them, the phase of these eddy currents being retarded by their self-induction. Hence, if we have an electro-magnet M, excited by an alternating current as in Fig. 1, and if we hold lightly an aluminum ring R, just above the pole of the magnet, we find that the alternating magnetic field will react in the manner just described, and forcibly repulse the ring upward, causing it to assume the position indicated by the dotted ring.

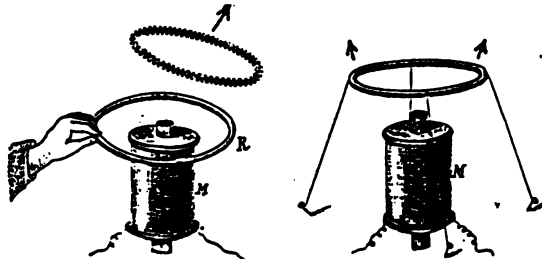


FIGURE 1.—Demonstration of the Levitation Phenomenon Occurring When an Aluminum Ring Is Placed Over an Alternating Current Magnet M; the Ring R Being Repelled Upward.

Again, if the aluminum ring is held by four cords and the alternating current passed thru the magnet coil, the ring will remain floating in space above the magnet as shown.

In the Bachelet system of levitated locomotion, there is involved a fundamental disadvantage, which rapidly assumes alarming proportions when one comes to consider building a commercial railway of this type. This disadvantage lies in the fact that the cars, made of aluminum or having suitable aluminum inductor plates mounted underneath them, are intended to be levitated or raised into space, so as to eliminate mechanical friction between the cars and the track, by a contiguous series of powerful and expensive electro-magnets spaced evenly along the track and just below it.

It does not require a great deal of calculating to arrive at the conclusion that it would cost a small fortune to build such a railway even if it were only a few miles in length, if it had to be equipt with such a series of closely spaced, powerful electro-magnet coils.

As is well known, it is possible to arrange an electro-magnet of proper proportions between two horizontal aluminum plates, and when excited by an alternating current, it will be found that the reaction of the magnetic flux set up will lift the magnet coil above the lower aluminum plate, and also cause the upper aluminum plate to be levitated, or raised above the coil.

Here is the germ of a revolutionizing idea, viz., why not transpose the conditions in the Bachelet levitated railway system, and instead of lining the track with millions of dollars' worth of electro-magnets, simply place the levitated magnets within the car and construct the lower rail of properly spaced aluminum inductor sections? By this means it becomes more feasible to construct such a levitated railway and at various points along the railway suitable ring-shaped solenoids or hollow tubular electro-magnets are placed to propel or pull the car forward.

The accompanying diagram, Fig. 2, shows several details of the levitated electric railway which the editors believe would work out successfully, if the engineering details are properly taken care of. The car itself is patterned after the modern Zepelin flying machine, having the front end in the form of a hyperbola and the rear end tapered off, so as to offer the least possible resistance to the air as the car shoots forward at the rate of 500 miles per hour. A series of powerful levitating electro-magnets are mounted under the floor and within the shell of the car as shown. A high tension alternating current is supplied over feed wires carried on cross arms at the top of the tubular track system, and this current could be taken into the car thru special contact shoes or wheels on either side of the car body; this alternating current being used to excite the levitating magnets for lifting the car from the track.

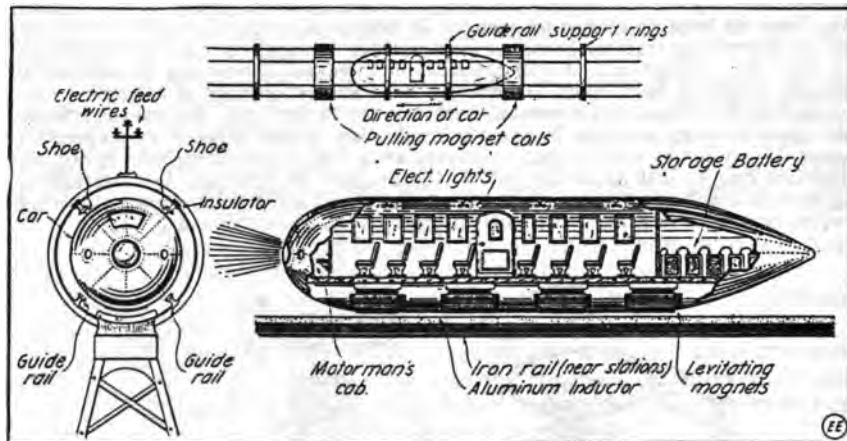


FIGURE 2.—The 500 Mile Per Hour Electric Railway of the Future Will Quite Likely Be of the Levitated Type, as Here Illustrated. Powerful Electro-Magnets Within the Car Raise It Above the Track, While Properly Spaced Solenoids Pull the Car Along.

The road-bed is built up of a specially designed aluminum inductor rail, with a lower sub-rail of iron at station approaches. A small storage battery could be carried

at the rear of the car so that in slowing down or stopping, and instead of exciting the levitating magnets with alternating current they could be charged with direct current from the storage battery, and thus a greater frictional effect produced between the moving car and the rail. The flux from the electro-magnets within the car would, in this case, react on the iron sub-rail.

The car would be propelled forward in a manner similar to that of Bachelet's, or by means of powerful electric solenoids placed along the track, as shown in the accompanying plan view. The details of switching, etc., are not given, as there are several different ways in which this could be taken care of, but in some of the schemes developed in this direction, the opening and closing of the solenoid circuits as the car progresses on its way, is functioned or cared for by the movement of the car itself, in other words the car, as it moves along, passes over a set of electrical contacts placed between solenoid points, so that the solenoid is de-energized just as the car approaches it; the momentum of the car carrying it forward owing to the powerful magnetic pull of the solenoid which had acted on the car a brief instant before. This is the principle upon which electro-magnetic guns operate also.

There is still another way to reduce the initial installation expense of such a railway system, by placing the locomotion coils or electro-magnets within the car, or rather on the car; these moving solenoids to act on iron rings or armatures of suitable cross-section placed along the track. The current can be periodically switched on and off automatically, so as to act in the manner above described, whereby the electro-magnet coil would be deenergized just at the instant where the moving car is approaching the point of maximum magnetic pull, in any event, this particular action simmers down to the point where what is required is a powerful electro-magnetic pull between an iron mass and the electro-magnet.

This all sounds very simple, as well as impracticable, but a system of this kind can be worked out, and has been tried out, in fact, in the laboratory by M. Bachelet and other inventors, with track systems having a length of 1,700 feet and more.

Such a high speed, tubular electric railway system would have many advantages over present day methods of transportation, and one of these is that the peculiar design of such a railway lends itself well to support on a single row of steel towers in the manner shown on our front cover, and the elimination of local stops.

While the hypothesis and ideals of Professor Weinberg as previously outlined, not to mention those of numerous other inventors and scientists, have often been rudely shattered by the more level-headed and slow-going intellects of the day, it really does not seem so rankly impractical to conjecture on the possibilities of such a high speed railway somewhat of the type here described. A fortune awaits the man who, is big enough for the job. It wants another Tesla or Edison and he is bound to arrive sooner or later.

Secretary PEÑA. Thank you, Mr. Chairman.

Senator EXON. You are excused.

Secretary PEÑA. Thank you, sir.

Senator EXON. I would now call panel No. 1: Mr. Graham Claytor, Jr., president and chairman of the National Railroad Passenger Corporation—Amtrak; Mr. Edwin Harper, president and chief executive officer of the Association of American Railroads; and Mr. Donald C. Buchanan, director of Railroad Workers, Sheet Metal Workers International.

Thank you very much for coming here today. Certainly we look forward to your testimony, and then some questions. As I previously indicated, your written statements have already been accepted and will be made a part of the record at the appropriate point.

We will start with panel No. 1 then, with Graham Claytor, Jr. Welcome back, Mr. Claytor, once again. No one has been before the subcommittee and the committee more over the years than you. We always look forward to your testimony, and especially your expertise in helping us move forward on this exciting new development of high-speed rail. We also have some of the same concerns that you might have as we move forward, to make sure we adequately take care of Amtrak passenger train service. Mr. Claytor.

STATEMENT OF W. GRAHAM CLAYTOR, JR., PRESIDENT AND CHAIRMAN, NATIONAL RAILROAD PASSENGER CORPORATION

Mr. CLAYTOR. Thank you, Mr. Chairman. I am always pleased to be before this committee. And I am particularly excited today, for the same reasons you are. This is a whole new approach that we are able to look at.

Mr. Chairman, you and members of the subcommittee have long been leaders in improving the Nation's transportation system, through enhanced rail passenger service. Now, with the administration's high-speed proposal, the Nation is poised to experience the enormous potential of high-speed rail passenger service in a widening area. The impact on passenger transportation and on the quality of the air we breathe is going to be very significant.

While Amtrak would like to see ultra high-speed projects, such as the French TGV, or magnetic levitation systems, the very high cost of these is such that we are concentrating our initial efforts on incrementally upgrading existing railroad lines, to provide high speeds in the more modest 125 to 150 mph range. The key focus for this kind of high-speed rail service would be to achieve a trip time that provides travelers a convenient and comfortable alternative to the automobile and the airplane in heavily populated corridors of 600 miles and less.

We are interested in maglev and in TGV. As a matter of fact, we have been designated as the operator of a maglev project that has been proposed in Florida, and we are very interested in that. We would hope that, if the TGV project in Texas goes forward, we would be able to participate in that as an operator. But we are not in a position to either engage in the financing or the organization of these projects, and we are concentrating on what I call the incremental approach, on using high-speed on existing railroad tracks throughout the country.

Now, we believe that our experience in the Northeast Corridor, and the extension of high-speed service between New York and Boston, provides a model for other corridors with existing high-quality rail lines.

We are delighted that the administration bill includes, in Section 4(e) of S. 2839, an authorization for this Northeast Corridor improvement project, which provides the authority for Amtrak to proceed with the procurement of electric high-speed train sets for the Northeast Corridor, and nonelectric train sets for other corridors. In other words, this does include an authorization for us to go forward with a sample program in the Northeast, which will provide the base for our operating in corridors outside the Northeast.

We are now in the process of developing this Nation's first high-speed rail passenger equipment, building on the successful operational and marketing tests of the Swedish X-2000 train, and the test to be made this summer on the German ICE high-speed train. As you may know, Amtrak, in cooperation with the Coalition of Northeast Governors has previously tested other foreign equipment on the corridor, including a Spanish train set, a Canadian LRC train set, and a French-developed Turboliner.

Amtrak intends to use a portion of the \$14 million already appropriated for the development of a dual-mode, high-speed locomotive for engineering work with our suppliers on this, as well as on a fos-

oil-fueled diesel or turbo locomotive, with the power and speed needed for use in nonelectrified territory, pulling the same high-speed train sets that would be ordered for use on the electrified Northeast Corridor.

Amtrak has also strongly endorsed, and agreed to participate in, a proposal made by New York State, to develop operating and maintenance data on the latest generation turbine engine, which is one of the important nonelectrified types of power that we would be looking at. Approximately \$2.5 million of the \$14 million already appropriated will be used in this particular effort.

In addition to completing its Northeast Corridor electrification and providing under 3-hour service between Boston and New York, Amtrak certainly hopes to be an important player in any corridor operation outside its Northeast Corridor. Its experience here will be invaluable on such new corridors. Amtrak's precise role in these new high-speed corridors will necessarily depend on the particular circumstances.

We believe the most efficient and effective way would be for Amtrak to provide, maintain, and operate the high-speed equipment for its own account, just as it now handles its Northeast Corridor and Metroliner service trains today. This would require an assured source of major capital funding to Amtrak, for equipment and maintenance facilities.

Whether any financial operating assistance, comparable to that in 403(b) or otherwise, would also be required, would depend on projected revenues and costs of the particular project. We would hope, initially, to be able to select a corridor where market conditions would make any such additional operating subsidy unnecessary.

A second possible scenario would be for the State or other sponsoring entity to provide the high-speed rolling stock and maintenance facilities that conform to Amtrak's requirements. Operating and maintenance of equipment would then be performed by Amtrak under a contract, generally similar to those in effect between Amtrak and local commuter authorities. Amtrak could also contract for the infrastructure maintenance, if desired, although this might be contracted for with the owning freight railroad, or with somebody else.

Still a third possibility would be for the State or local high-speed authority to acquire, operate, and maintain the high-speed equipment and infrastructure itself, or contract with the freight railroad or someone other than Amtrak, to do this. Amtrak would normally want to bid on such a contract, but we would be willing, in most cases, to act as a consultant under contract, if that appears to be the best approach under the circumstances.

As Congress considers the administration's high-speed rail proposals, I would like to raise an issue that I see as critically important to the success of high-speed rail of any type. That is the funding method to be used.

Clearly, the current erratic means of funding the Nation's investment in passenger rail, and that is conventional rail that we presently operate as well as the proposed high-speed rail, this is simply too unreliable a process on which to depend for the long-term development of high-speed rail. The size of the investment proposed

by the administration, over \$1 billion total, may be difficult to accomplish through the current appropriation process, however well-intentioned the policymakers may be.

That is why Amtrak and other transportation and environmental interests have so strongly supported establishment of a dedicated, intercity passenger rail capital trust fund, to provide a reliable and increased source of annual capital funding for Amtrak and high-speed rail.

A dedicated, intercity passenger rail capital trust fund would provide planners and financial institutions the level of confidence and constancy they need to leverage non-Federal investment in improved rail passenger facilities and high-speed rail equipment. We can borrow enough, if we have an assured source of capital to make up the full amount needed. And that can only be accomplished if we have an assured source for funding. The on-again, off-again appropriation process just will not give the private bankers, who may finance some of our equipment, the confidence that they can go ahead, if we do not have something like that.

The funds thus generated could be used to support the rail programs and investments that fall under the jurisdiction of this subcommittee, and that includes Amtrak, the Northeast Corridor Improvement Project, and the development of high-speed corridors outside the Northeast Corridor.

The question you raised, how many of these outside corridors can we develop at once, is a good question. While I continue to believe that Amtrak should implement these new corridors incrementally, developing them as far as Amtrak is concerned, one at a time, and using the initial experiences to move more efficiently and rapidly on additional high-speed corridors, we could start the process by having any interested States put forward their requests for high-speed corridors, and the Department of Transportation could analyze and process these for eventual implementation.

But if Amtrak is going to implement them, I think we have to take it serially. We cannot take a batch of them at once. Amtrak has not got the capability of doing that, and I doubt if anyone else has. However, the way to start is to start, and that is what we want to do, as soon as possible.

Another issue that must be addressed, which you have already mentioned today, relates to potential passenger injury claims arising out of high-speed rail passenger operations. The threat of excessive punitive damage awards in particular is so great that the freight railroads have made clear that they must be protected from this liability, by total indemnification from Amtrak or other passenger train operators, if high-speed rail is to expand off the Northeast Corridor and onto their railroads.

This issue is discussed in some detail in my prepared statement, and I will not deal with it further here, because of the time element. However, I would like to ask that a paper prepared for Amtrak by outside counsel, that details situations where Congress, the courts, and the States have limited or precluded punitive damages, be submitted for the record. And I would like to submit it at the close of the hearing.

Senator EXON. Without objection, that is ordered, and we are very pleased to have it.

Mr. CLAYTOR. The resolution of this liability issue is of absolutely fundamental importance. Amtrak will work with this, or other, appropriate congressional committees on this issue in the coming months, to help identify a viable means of solving the problem.

A limitation on just certain aspects of punitive damages might solve the problem. There probably are other approaches, as well. But the problem has got to be solved, or we are not going to be able to run these high-speed trains over the freight railroad corridors, and I think that is going to be essential.

Finally, Amtrak is very pleased with the 5-year program in the administration's proposed high-speed initiative bill. This recognizes many of the issues that Amtrak has addressed in its incremental approach of upgrading existing corridors for high-speed service.

Amtrak has undertaken many of the activities that this bill is designed to promote and help fund. We have expertise and experience in a number of areas that we would be happy to provide on a contractual basis to States or other applicants under the administration's bill. In other words, we have already done the work to improve existing freight railroad for high-speed service. We know the problems. We know how to do it. We would like to have that expertise available to any State that wants to file an application. We would be happy to contract with a State to do that.

We look forward also to working with the Federal Government and the States to develop the infrastructure and capabilities needed to realize high-speed rail around the country.

Mr. Chairman, my colleagues who are here in the audience and I would be pleased to try to answer any questions the subcommittee has.

Thank you.

[The prepared statement of Mr. Claytor follows:]

PREPARED STATEMENT OF W. GRAHAM CLAYTOR, JR.

My name is W. Graham Claytor, Jr. I am President and Chairman of the Board of the National Railroad Passenger Corporation, better known as Amtrak. I am extremely pleased to have the opportunity to appear before the Subcommittee today to discuss Amtrak's important role in the development of high-speed rail transportation in this country. First of all, I want to make it clear that Amtrak is delighted that Secretary Peña and the Administration have come forward with their high speed rail initiative bill. We are especially pleased that the Administration bill includes the authorization of the Northeast Corridor Improvement Program (NECIP) which provides the authority to proceed with the procurement of electric high-speed trainsets for the Northeast Corridor and non-electric for other corridors.

Amtrak is in a unique position to comment on high-speed rail development. Besides being the sole operator of high-speed service in this country, Amtrak is currently developing an existing conventional-speed passenger and freight line into a high-speed corridor. Amtrak also provides conventional service on at least part of each of the corridors recently identified by the Department of Transportation as potential high-speed routes. Finally, Amtrak is in the forefront of developing high-speed rail equipment for both electrified and non-electrified service.

Being fully committed to the full-range of high-speed development and operations, Amtrak has experienced firsthand the financial implications of high-speed rail operations and the need for predictable long-term funding to finance them. This hearing provides an opportunity to discuss these elements and their vital interrelationship. In addition, I am personally delighted to see that the Administration is suggesting that the federal government, in partnership with the states, begin committing resources toward improving the railroad infrastructure in a way that will allow the development of high-speed rail passenger corridors on existing tracks. I am confident that the expertise of this Subcommittee, which plays such a significant role in this nation's railroad policy, will develop the type of legislation that will help put the United States in the same high-speed rail league as our European friends.

HIGH-SPEED RAIL DEVELOPMENT

High-speed rail development will have a great impact on, and in many areas will define, Amtrak's future in the national transportation system. We intend to pursue aggressively opportunities to design, build, operate and maintain new high-speed systems. While our ability to help fund the cost of these systems is strictly limited, our goal is to be the high-speed rail operator of choice in this country.

While I know that the Subcommittee is very knowledgeable about the various categories of high-speed rail transportation, there is still some public confusion and misunderstanding about this. There is a substantial difference between what I like to call "high-speed rail," with maximum speeds of 125 to 150 mph, and "ultra high-speed rail" with maximum speeds as high as 200 to 300 mph. Amtrak has already proven the feasibility in this country of providing "high-speed rail" service on existing tracks and roadbeds, built and used for many years for conventional-speed freight and passenger service. The "ultra high-speed" service, however, requires construction of a new and dedicated track system. This may involve the steel-wheel-on-steel-rail system such as those used by the French TGV and Japanese bullet trains, or it may involve the very different magnetic levitation systems that have been tested in both Germany and Japan.

Amtrak's interest in fast passenger service extends well beyond the 150 mph threshold to the operation of new "ultra high-speed"—150-300 mph—systems. The two most promising candidates for ultra high-speed rail in this country are the proposed TGV steel-wheel system between Houston, Dallas and San Antonio and the 15-mile magnetic levitation system planned at the Orlando International Airport in Florida. Amtrak has been designated as the operator of the Orlando project and plans to work with the sponsors of the Texas TGV project and to ultimately play the same role in Texas. We strongly support both of these projects.

Amtrak's intention to play a leading role in the high-speed rail revolution is based on two key motives. First, both types of fast rail will contribute significantly to improving the nation's transportation system and enhancing regional air quality—both desirable long-term public policy objectives. Our Northeast Corridor experience vividly demonstrates this, with respect to 125-150 mph service on existing railroad tracks. Although Amtrak's long-distance service is being recognized as increasingly important to the nation, particularly to rural America, we must also address the critical highway, airport and airway congestion and air quality concerns in our most densely populated transportation corridors. With our extensive experience to date and our nationwide coverage, it is most appropriate that Amtrak assume a leadership role in the inevitable increase that is coming in high-speed rail.

Second, our success in the Northeast Corridor demonstrates that high-speed train service on existing railroads can generate revenues over its above-the-rail operating costs. Existing Metroliner Service trains, for example, cover up to 200 percent of these costs, including both of what we call short-term and long-term avoidable operating costs, thus contributing significantly to Amtrak's fixed costs and bottom line. Revenues from Amtrak's growing contract commuter operations and from its future high-speed rail operations increasingly contribute to our goal of covering more of our total operating costs. However, as discussed in more detail later in my testimony, our experience also demonstrates that it will be virtually impossible for any high-speed system at the outset to fully cover its cost of capital—both construction and long-term infrastructure maintenance costs—without substantial public assistance. Federal and state funding for these capital costs—from the incremental upgrade of existing rail lines to construction of new dedicated rights-of-way—will be essential if high-speed rail is to progress beyond the Northeast Corridor. I think it would be useful to provide the Subcommittee with a brief summary of the progress we are making in high-speed rail development in a number of areas, as well as to discuss several other issues that I believe are critical to the successful development of high-speed rail transportation in this country.

AMTRAK'S NORTHEAST HIGH-SPEED RAIL IMPROVEMENT PROJECT

Amtrak is making substantial progress towards its goal of reducing rail travel time between New York and Boston to under three hours. As this Subcommittee knows, over the next four years, Amtrak plans to electrify and upgrade this portion of the Northeast Corridor to permit up to 150 mph operations. The result will be a rail line supporting high-speed intercity passenger trains, numerous commuter rail operations, and appropriately scheduled freight rail service. Importantly, between 2.5 million and 3 million additional riders are projected to switch from other transportation modes to rail, thereby reducing congestion on the region's highways and at its limited capacity airports and contributing to improved air quality. Given the very high cost of building dedicated rights-of-way for ultra-high-speed rail sys-

tems, this incremental improvement approach using existing rail lines is the likely scenario for most early high-speed rail systems in this country in densely populated transportation corridors.

Amtrak has been charged with the responsibility for implementing and managing this Northeast construction project. We take this responsibility extremely seriously and have created a highly competent and efficient project organization. I am very confident of Amtrak's ability to achieve all of the project objectives in a manner that will make it a model for high-speed rail construction on other high-density corridors throughout the United States.

Importantly, incrementally upgrading existing passenger rail lines helps generate a growing market for the high speed service and produces operating revenues that can help fund future improvements or the acquisition of high-speed equipment. The greater the reduction in trip time, the greater the demand for the service. In this way the nation can achieve transportation and air quality benefits even if federal budget constraints restrict the pace at which the high-speed rail improvements are implemented. In this regard, the key focus for high-speed rail should be achieving a trip time that provides travelers a competitive alternative to the automobile or airplane. Top speed of the service is essentially irrelevant compared to the average speed and total trip time. The incremental approach to high speed rail development allows the market to adjust to improved rail passenger trip times.

The Northeast High-Speed Rail Improvement Project is strongly supported in the Northeast by transportation planners and environmentalists and is expected to help generate important regional economic and job growth. The significant ridership impact will help regional compliance with the Clean Air Act and could help to avoid the enormous cost of local airport and highway expansion projects. While it is inevitable that there will be some opposition to electrification and additional train movements from some of those living immediately adjacent to the rail line, the concerns that have been raised to date are the focus of review by the federal government and will be addressed in the Environmental Impact Statement.

HIGH-SPEED RAIL EQUIPMENT DEVELOPMENT

Of equal importance are Amtrak's plans to develop a family of standardized high-speed rail passenger equipment components that will result in consistent high-speed rail service in numerous corridors in this country, and significantly reduce the cost of designing, producing and maintaining the cars and locomotives. Amtrak is now in the process of preparing specifications for the procurement of the new high-speed trains, resulting in the development in this country of a broader rail car and locomotive manufacturing capability. This will have major implications for national economic development and will act as an important spur to development of high-speed rail elsewhere in the country.

If high-speed rail is to develop outside the electrified Northeast Corridor, however, a new generation of non-electric locomotives capable of high acceleration and sustained speeds of at least 125 mph must be developed. These locomotives are essential for high-speed operations on corridors such as Detroit-Chicago and Portland-Seattle-Vancouver.

Until recently there has been no market in this country for high-speed rail equipment. Consequently, there has been no incentive for the industry to invest research and development funding for high-speed locomotives, particularly for the non-electrified corridors outside the Northeast. Although Congress has appropriated some \$14 million to Amtrak to develop such a locomotive (with the capability to also operate electrically under third rail power), Amtrak has not been satisfied with the proposals it has received from its several manufacturers.

As a result, Amtrak has adopted a two-prong strategy to push industry as quickly as possible towards development of a satisfactory non-electric high-speed locomotive.

- Amtrak has strongly endorsed and agreed to participate in a proposal made by New York State to develop operating and maintenance data on the latest generation turbine engine. Because high-speed non-electric operations may well depend on turbo technology, this test could prove to be an extremely beneficial next step in the development of high-speed locomotive technology for non-electrified rail lines.

- Amtrak views procurement of 26-30 new high-speed electric trainsets for the Northeast Corridor as the most important early step in bringing high-speed rail equipment to the rest of the country. The technology currently being evaluated for these trains includes tilting capability, good acceleration at higher speeds, integrated internal communications, standardized power and comfort subsystems, telecommunications and video systems, and high-speed trucks and suspension systems. A next step would be to integrate these characteristics into a family of high-speed equipment that can be used systemwide, building perhaps on the turbine train men-

tioned above. As a result, Amtrak intends to include in its procurement development of acceptable electrically powered high-speed trainsets the feasibility of substituting acceptable non-electric power units, including at least some with a dual-power third-rail capability.

These power units could be substituted for the electric locomotive when used on non-electrified rail lines, such as on the Empire Corridor and other routes radiating off the Northeast Corridor, as well as other potential high-speed corridors including the five identified by the Department of Transportation. The non-electric locomotives will be fossil fueled, with three-phase AC drives or hydraulic transmissions to achieve speeds of at least 125 mph, depending on the route profile and curvature. The key technological milestone will be the ability of the new locomotives—whether diesel or turbo—to provide extra horsepower for short time periods to generate the high acceleration required to reduce travel time on most routes.

With this strategy, Amtrak hopes to be able to encourage the industry to push the technological envelope as far and as rapidly as possible in the development of high-speed non-electric motive power. In this way, Amtrak will help set the standard for high-speed rail equipment development in the nation, much as it is setting the standard for upgrading rail lines to permit high-speed operations. Amtrak will work closely with private industry and state and federal agencies in this effort to advance high-speed fossil-fuel locomotive development. With our operating experience and the technical know-how in the industry, we believe that this public/private partnership is the best and most practical way to achieve the research and development necessary to attain high-speed rail service in many areas in this country. This is an area that holds much potential and challenge for American manufacturing and, indeed, the future of widespread American high-speed rail may well depend on it.

I am hopeful that as the Subcommittee considers the Administration's high-speed rail legislation it will consider the importance of an equipment component that will assist Amtrak and the Federal Railroad Administration in encouraging the private sector to develop high-speed passenger equipment and to enable Amtrak to acquire new high-speed trainsets. With so many high-speed rail projects under consideration in this country, we risk enormous duplication of effort and costs if each project opts for different high-speed rail passenger equipment technologies. Amtrak has pioneered the development of existing generations of passenger rail equipment and is now embarked on developing the country's first family of true high-speed rail trainsets—both electric and non-electric.

In this way, we can ensure consistently high quality, national rail passenger service and take advantage of significant economies in design and production. Federal funding for research on equipment issues and acquisition of high-speed trainsets would help ensure that nationwide equipment procurement is coordinated and done in the most cost effective way possible.

SUMMARY OF COSTS FOR DEVELOPING EXISTING FREIGHT RAILROAD TRACKS FOR HIGH-SPEED PASSENGER CORRIDORS

In addition to funding Amtrak's needs for equipment and engineering for off-corridor high-speed operations, multiple sources of funding will have to be tapped to bring these objectives to fruition. While the capital costs needed in high-speed operations over existing freight-owned railroad lines are far less than the costs involved in constructing a whole new dedicated railroad required for ultra high-speed passenger service, these costs are not small. The infrastructure improvement costs for each corridor will be unique to that corridor and will depend on a great many different factors—quality of track and bridge structures; curvature; signal and train control systems; number of running and passing tracks; number, location and control of interlockings; number of grade crossings; volume and nature of existing freight and passenger traffic, etc. While it is not practical to reach generalized conclusions about these costs without detailed analysis of each proposed route, it is feasible to list several categories of problems that must as a minimum be resolved in all cases. I list the following as a reasonable sampling of these.

(1) *Highway Grade Crossings.* All highway grade crossings over which trains will operate at 100 mph or more should be closed or eliminated by overpasses or underpasses. At these speeds, the likelihood of a major derailment with resulting passenger casualties from a collision with an automobile or truck that has run around or crashed through the gates is too great. These problems are really a highway responsibility and the major funding for grade crossing elimination should come from highway funds.

(2) *Signal Improvements.* Under present (and we think appropriate) FRA regulations, passenger train speeds may not exceed 79 mph without signals that register

in the locomotive cab or provision of an automatic train-stop system. As a practical matter today, this means the installation of the essential elements of an Automatic Train Control System (ATCS). In many cases this will significantly benefit the freight railroad operation as well, but it is quite expensive to install. A significant part of this cost must come from appropriate state DOTs, community contribution, ISTEA, or FRA. These signal and train control improvements are a critical safety measure.

(3) *Running and Passing Tracks and Interlockings.* The extent of running and passing tracks and interlockings needed will depend on the volume and nature of the freight and passenger traffic to be accommodated. In a few cases, extensive additional trackage on the same right-of-way may be required, and in almost all cases, some improvements will be needed if high-speed passenger trains are to be added.

(4) *Rail, Tie, Bridge and Track Improvements.* On some routes, the rail line may have welded rail, wood or concrete ties in good condition, satisfactory bridges, etc., but again significant expenditures may be required to assure the quality required for high-speed passenger use.

The proposed capital authorized in the Administration bill will not be sufficient to cover the funding that will be required to adapt existing freight railroad tracks for high-speed passenger service on the designated corridors. In fact it could not handle more than a modest fraction of the infrastructure improvement costs on one corridor. Other sources must be utilized if high-speed corridors are to be developed on existing tracks.

The freight railroads, through the Association of American Railroads, have indicated a willingness to work with Amtrak and others to develop these corridors for high-speed passenger service, but only if they can be guaranteed this will involve no net cost to them, and with adequate protection against liability.

ADDRESSING LIABILITY CONCERNS

An issue that was discussed in Amtrak's 1993 Legislative Report regards the legitimate concerns of freight railroads about potential passenger injury claims resulting from Amtrak future high-speed operations over their tracks. Clearly, the potential cost of an unfavorable jury award as a result of a passenger train accident could easily exceed (many times over) the revenues or other benefits received by freight railroads for high-speed operations conducted by Amtrak over their lines—a degree of liability that could not have occurred but for the operation of the passenger train.

The factor most responsible for driving up the cost of this type of liability is the ability of juries to award punitive damages when a jury determines, often on highly conflicting evidence, that an employee of a defendant company is guilty of conduct that is more serious than ordinary negligence. In order to deal with this significant liability issue Congress should consider a number of solutions. One approach might be to provide an exemption from punitive damages for injuries to train passengers; another approach would be to adopt and fund a financial mechanism that, in effect, would cover these types of costs that are indemnified by Amtrak or other passenger train operators.

This is an important issue with enormous repercussions on the development of high-speed rail on privately owned railroad rights-of-way. Amtrak urges Congress to address this issue so that we can progress the development of high-speed rail in some of the nation's most heavily traveled transportation corridors. Amtrak is anxious to work with the Subcommittee in attempting to develop creative solutions to this difficult problem.

FUNDING HIGH-SPEED RAIL DEVELOPMENT

A critical issue that remains to be addressed is how to provide the capital necessary to upgrade existing or build new railroad infrastructure and to acquire the expensive high-speed rail equipment for new service. Funding for equipment is of particular concern since the same set of equipment may operate in many states and hence is less likely to be a candidate for funding under state transportation programs.

As this committee knows, the most significant barrier to Amtrak's growth and to the development of high-speed rail is the lack of a secure source of capital funding. Today, Amtrak's assets depreciate at a rate between \$150 million and \$200 million per year. Just to keep even we must invest in our infrastructure at a rate above that at which our assets are depreciating in order just to cover inflation. Over the past few years, Amtrak's capital appropriation averaged far less than \$100 million. In fact just since the mid-1980's Amtrak's capital funding shortfall is in excess of a half-a-billion dollars before allowing for inflation. Amtrak's ability to invest in new equipment and plant modernization will drive its financial performance for the rest

of the decade. Legislative proposals to use one of the two and a half cents of federal fuel tax, initially allocated for deficit reduction, or an equivalent amount from some other source, to create a rail passenger capital trust fund, would go a long way to solving Amtrak's capital problems and would allow us to purchase the equipment we need as we start developing any of the proposed high-speed corridors, including the 26-30 train sets we plan to operate in the Northeast Corridor. The lack of a secure source of capital funding for passenger rail has several major negative implications:

- First, Amtrak has had to borrow capital for replacement equipment at a far faster rate than projected. We already have gone to the private financial markets for significant funds to acquire Horizon Fleet cars, Superliners, material handling cars and new locomotives. We originally projected that we could afford to finance approximately half of the cost of such equipment; in fact, because of limited capital funding, we have financed 75 percent to 80 percent of these purchases.

- Second, the debt service related to these and other expected purchases represents a heavy burden on our operating budget. We cannot continue to generate debt at this rate without destroying our credit or even risking bankruptcy. Accordingly, we will have to depend more and more on future capital appropriations to cover the cost of equipment so that we do not become overburdened by debt.

- Finally, during the next five years Amtrak's equipment needs will be significant because of an increasingly aging fleet, the need to provide a modest increase in capacity, and the need to acquire newly designed high speed trainsets.

Accordingly, Amtrak is at the point where additional private borrowing for these equipment acquisitions would not be prudent even if available and would clearly be inconsistent with the goal of reducing Amtrak's need for federal operating assistance. In fact, with the anticipated financing of the 26-30 high-speed train sets, Amtrak will have reached its internal limit of \$1.2 billion in private financing. The investment of federal appropriated capital thus will be essential if we are to undertake these critical acquisitions.

The shortfall in capital also has undermined Amtrak's ability to make the investments that are critical to its future progress, as well as to reducing the level of needed federal operating support. Our success in this area is premised on expanding ridership and revenues through additional equipment and on improving the efficiency of our operations through plant modernization. We estimate a need for some \$4.6 billion in capital before the end of the decade in order to achieve this capacity growth and efficiency gain. However, we already are behind in funding the projects that will have to be undertaken if we are to move ahead in reducing the annual federal operating support now required to operate our national system.

COMMENTS ON ADMINISTRATION'S HIGH-SPEED RAIL PROPOSAL

Finally, Amtrak is delighted with the Administration's interest in high-speed rail as evidenced by the introduction of the High Speed Rail Development Act of 1993. I would note, however, that while the proposed legislation (S. 839) authorizes resources for states to upgrade high-speed rail corridors, it leaves the issues of equipment and equipment maintenance, as well as infrastructure maintenance, unauthorized and unaddressed.

Amtrak certainly hopes to be an important player in any high-speed corridor operation outside our Northeast Corridor. Its precise role in any case will necessarily depend on the particular circumstances. If adequately funded, Amtrak is extremely qualified to provide, operate and maintain new high-speed rolling stock, as well as to maintain the improved rail infrastructure required. This could be done in several different ways.

We believe the most efficient and effective way would be for Amtrak to provide, maintain and operate the high-speed equipment for its own account, just as it handles its Northeast Corridor Metroliner service today. This would require an assured source of major capital funding for equipment and maintenance facilities. Whether any financial operating assistance comparable to that in Section 403(b) or otherwise would be required would depend on projected revenues and costs; we would hope initially to select a corridor where market conditions would make this unnecessary.

A second possible scenario would be for the state or other sponsoring entity to provide the high-speed rolling stock and maintenance facilities that conform to Amtrak's requirements. Operation and maintenance of equipment would then be performed by Amtrak under a contract generally similar to those in effect between Amtrak and local commuter authorities. Amtrak could also contract for the infrastructure maintenance if desired, although this might be contracted for with the owning freight railroad or someone else.

Still another possible scenario would be for the state or local high-speed authority to acquire, operate and maintain the high-speed equipment and infrastructure itself, or contract with a freight railroad or someone other than Amtrak to do this. Amtrak would normally want to bid on such a contract, but would be willing in most cases to act as a consultant under contract if that appears to be the best approach under the circumstances.

Amtrak stands ready today to work with the states. We view our experience as the sole operator and developer of high-speed rail service in the country as providing a model for the development of other high-speed rail corridors around the country. Amtrak provides conventional service along those corridors already identified by the Department of Transportation. Amtrak is also anxious to provide planning assistance to states on a contractual cost-plus basis in all areas of high-speed rail including equipment and infrastructure design, signalization and train control maintenance, safety, marketing, and reservation systems. Amtrak has already incurred the considerable costs of developing these and other systems and capabilities. It does not make sense for the states to have to incur development costs for systems already in place.

Amtrak's experience in developing high-speed rail, especially with the associated costs, indicates that funding should be concentrated on identified feasible projects that can produce demonstrable results in a reasonable amount of time. Amtrak's experience can help achieve both of these goals.

CONCLUSION

High-speed rail can play an important role in helping to address the nation's transportation and environmental needs. For our part, Amtrak intends to be a leader in developing high-speed rail technologies and in operating the nation's high-speed rail systems. We are the most experienced in the country in this area and, in many ways, our successful involvement in high-speed rail transportation will determine our success in the future. Amtrak looks forward to working closely with the Subcommittee in shaping a high-speed rail future for this country.

Senator EXON. Mr. Claytor, thank you very much. I really appreciate your bringing up some very key issues. You are thoroughly experienced in the railroad industry and we take into consideration the excellent points you have made. Once again, thank you for all the help you have been to this chairman and others over a period of years as we have fought to make Amtrak the very important part of our transportation system that it is today.

Thank you.

Mr. CLAYTOR. Thank you, sir.

I would like to add to that the point you made that while we are extremely interested in these high-speed corridors, 60 percent of Amtrak's revenue comes from our long-distance conventional service. And it is very important to the rest of the country that that conventional service not only be maintained and improved, but expanded. And that is one of the things we need this assured capital funding for, not only to do the high-speed rail, but to continue to maintain, improve and expand our conventional service that is equally important to much of the country.

Senator EXON. Thank you.

That is an excellent point. I hope that the record is clear. The testimony that we received here today has indicated over and over again that this is about a total transportation system. We have a tendency, I am afraid, today to look at only sections or segments of our total transportation system. We are a very large country geographically. We have an obligation to see that transportation is a transportation network for America and not a transportation network that some people think of as only theirs and interest from point A to point B in a particular section of the United States, North, South, East or West.

Mr. CLAYTOR. Yes, sir.

Senator EXON. Thank you.

Mr. CLAYTOR. Thank you.

Senator EXON. Mr. Harper, we are delighted to have you back with us again.

STATEMENT OF EDWIN L. HARPER, PRESIDENT AND CHIEF EXECUTIVE OFFICER, ASSOCIATION OF AMERICAN RAILROADS; ACCOMPANIED BY ROBERT BLANCHETTE

Mr. HARPER. Thank you very much, Mr. Chairman, Senator Robb. I am grateful for the opportunity to appear before you on the important issue of high-speed rail passenger service and the administration's bill, S. 839.

My prepared testimony has been filed with the subcommittee, and I ask that it be incorporated in the hearing record.

Senator EXON. Without objection, that is so ordered.

Mr. HARPER. I will summarize it very briefly.

This hearing is but one manifestation of the importance of modern railroads. High-speed rail passenger service can serve important social goals and the Nation's freight railroads are prepared to cooperate in realizing them. My testimony and the rail industry policy statement which accompanies it sketch the broad contours of the railroads' role.

Let me summarize four of the key issues that must be resolved in order to bring about high-speed rail passenger service.

No. 1, the railroads have a duty—railroad companies owe a duty to their principal stakeholders, who are their employees, their customers, and their shareholders, to do two things: (a) make a profit; and, (b) not take unreasonable business risks. In practical terms, this means that contracts between the railroads and the sponsoring passenger authorities must provide full compensation for the use of the railroads' facilities and services.

In addition, freight railroads must be indemnified and insured against any and all liability arising from accidents affecting passenger service. The railroads who might rent the use of their rights of way will never earn enough from high-speed rail passenger contracts to justify exposure to catastrophic loss, potentially involving hundreds of people moving at speeds of 150 miles an hour. Our industry lawyers have concluded that Federal legislation in this area may become a condition precedent to permitting operation over their rights of way.

Models for this already exist. The resolution of this issue cited by Secretary Peña, I believe, refers to the Virginia Rail Express, which in fact required Federal legislation to resolve the liability issue in that case.

The second issue: high-speed service is a new service, requiring free arm's-length negotiated contracts between the railroads and the operators of high-speed rail passenger service. Amtrak service, under the Rail Passenger Service Act, does not fully compensate the freight railroads. This is for historical reasons having to do with the circumstances of getting Amtrak started, when the freight railroads turned the passenger service over to Amtrak over 20 years ago.

High-speed rail service contemplated under S. 839 represents a totally different situation under which railroads, like any private business, must be free to enter into arm's-length bargaining. Therefore, the legislation should emphasize the service is not being conducted under the Rail Passenger Service Act.

Moreover, corridor designation should be conditioned on the sponsoring authority having an agreement with the owner of the right of way.

The third issue: grade crossings and high-speed rail passenger service are incompatible. The industry, including Amtrak, is unanimous in the view that at speeds over 100 miles an hour the risk of grade crossing accidents is unacceptable. This is, in our view, essentially a highway problem, but one that must be addressed.

I am concerned that the bill is too restrictive and will result in inadequate funding for addressing the grade crossing problem. Funding in this bill should be permitted for any grade crossing project on a high-speed corridor. Otherwise, the program will divert funds away from grade crossing safety programs across the country for a few high-speed corridors.

The fourth issue: high-speed rail must not be subsidized by freight shippers. In other proceedings it has been suggested that a 2.5-cent tax on railroad diesel fuel now used for deficit reduction be diverted to high-speed rail, or that railroads somehow should contribute to high-speed rail by reducing the compensation due them in proportion to the value received from the improvements made in the rights of way.

Such suggestions, I feel, are inappropriate and should be resisted. High-speed rail improvements are not necessary for our primary business—moving freight. In fact, I would like to submit for the record a chart. This is based on a chart prepared by the General Accounting Office and submitted in testimony to the House of Representatives. We have analyzed the chart which essentially makes an estimate of kinds of upgrades that would be required from conventional rail service to bring it up to appropriate capacity to run 125-mile-an-hour speeds on a 200-mile corridor.

This GAO-prepared chart we have then analyzed, trying to identify which of the elements—for example, electrification is one element—that the GAO feels would be necessary for high-speed rail passenger service that is not necessary or appropriate for freight railroading.

For example, building of stations is another item that would be required for high-speed rail passenger service. Obviously, that is not required for the freight business. We have analyzed this and would submit it for your consideration and for the record.

Senator EXON. We just received this. I do not believe it was a part of your initial submission.

Mr. HARPER. It was not.

Senator EXON. Without objection, the referenced chart will be put in the record at this point to explain Mr. Harper's testimony. We thank you for that.

[The information referred to follows:]

GAO Upgrades and Approximate Costs for 125 mph Speeds on a 200-Mile Corridor

Upgrade	In millions of dollars	
	Total cost	Proposed value to railroads
Bridge repair/Modification	\$413.6
Electrification	400.0
Grade crossings	206.7	\$10.3
Added track	166.8
Signaling	89.1
Concrete ties	79.2
Stations	58.0
Continuous welded rail	30.6	7.5
Interlockings	13.7
Fencing	4.0	1.0
Planning costs and contingencies	584.7
Rolling stock	215.0
Grand total	2,261.3	18.8

SOURCES: Amtrak and Transportation Research Board, Special Report 233: In Pursuit of Speed—New Options for Intercity Passenger Transport (Washington: National Research Council, 1991).

COMMENTS

A. Bridge repair/Modification

No conceivable value for freight railroads. Costs include converting open deck bridges to ballast deck bridges; widening for added track and upgrading for higher speeds. Bridges have been properly maintained for existing service and forecasted freight growth.

B. Electrification

All industry sponsored studies have indicated that capital costs for structures and new locomotives far exceed operating fuel cost savings at present or even increased fuel prices.

C. Grade Crossings—\$10.3 million

Benefits are public benefits, essentially for highway safety. DOT has found that the railroad mode derives minimal benefit from grade crossing elimination programs.

D. Added Track

No benefit as physical plant is currently sized for freight operation. Added track would be configured for high speed passenger not freight, and would not be useful to freight railroads.

E. Signaling

Conventional signalling required for high speed passenger would not, of itself, be more beneficial for train control or safety than existing systems. Introduction of large operating speed difference between HSR and freight could cause a serious deterioration in operations.

F. Concrete Ties

Concrete ties have longer life than wood ties, however, they are not necessary except for dense or heavy grade, curved freight territory. Concrete ties for HSR territory are for ride quality (surface) versus strength and are not required except in special applications in freight service.

GAO's cost estimate assumes no concrete ties are now in place on any of the 200 corridor miles.

G. Stations

Freight railroads do not benefit from new stations—they have been eliminating theirs nationwide since inception of Amtrak (1971) as result of centralization and computerization of freight customer service functions.

H. Continuous Welded Rail—\$7.5 million

In most if not all HSR routes, CWR is already in place. Because of High speed Rail, a larger rail section may be required and would offer marginal benefits to freight railroads. Where conventional jointed rail would be replaced by CWR, freight railroads will receive some benefit. We estimate this is the vast minority of cases.

GAO's cost estimate assumes there is no CWR in place on any of the 200 corridor miles.

I. Interlockings

Interlockings are adequate for existing freight operations and speeds.

J. Fencing—\$1.0 million

Freight railroads will receive some value from protection of their rights of way from intrusion. GAO's cost estimate assumes there is no fencing on any of the 200 corridor miles.

K. Planning Costs and Contingencies

No value to freight railroads.

L. Rolling stock

Unique to High Speed Rail operation.

Overall, the freight railroads would receive benefits worth, at a maximum, \$18.8 million out of the total \$2.2 billion in expenditures contemplated by GAO. This estimate does not take into consideration the additional costs to the freight railroads from greater train interference, less operating flexibility, and greater exposure due to having High Speed Rail operations on their system.

Mr. HARPER. Thank you, Senator.

Any concept that the freight road should be targeted for a "contribution" to high-speed rail passenger service is basically a subsidy by America's basic industries—rail shippers. This sector creates prized industrial jobs in an area already under siege from international competitors.

The issues posed here are difficult to solve. But if they are resolved with fairness, the public benefits to the quality of life in America can be enormous. And to that end, America's freight railroads pledge their cooperation in realizing these benefits.

Thank you.

[The prepared statement of Mr. Harper follows:]

PREPARED STATEMENT OF EDWIN L. HARPER

Mr. Chairman and members of the Subcommittee, the Association of American Railroads (AAR) is grateful for the opportunity to present the position of America's major freight railroads on the subject of high-speed, steel-wheel passenger rail service and on the Administration Bill, introduced as S. 839.

My testimony will address these issues, and, as well, one troubling concern that our freight shippers be asked to cross-subsidize high-speed rail.

THE AMERICAN RAIL INDUSTRY AND HIGH-SPEED PASSENGER SERVICE

Before the introduction of S. 839, the American railroad industry issued a Policy Statement entitled "High-Speed Rail Passenger and Freight Services: Opportunities for Partnership," (February 3, 1993), attached to this testimony. That statement was prompted by the recognition that many corridors being considered for high-speed rail passenger service can be collocated on existing private railroad rights-of-way. That fact, and President Clinton's expressed interest in the matter, made timely that AAR's members, including Amtrak, articulate those principles which should be operative on such corridors.

The Policy Statement contains two principal themes. First, greater reliance on the railroad mode would serve important public goals and the owners of the rights-of-way are ready to lend their cooperation in corridors where collocation is physically practical. Secondly, where mixed passenger and freight operations are feasible, the railroad owner must be fully compensated for the use of its facilities and services. The freight roads cannot be expected to donate, directly or indirectly, in the form of equity or otherwise, their resources to fund those incremental improvements necessary to bring high-speed rail into reality.

Like any other business, the railroad industry must earn sufficient revenue over time to meet its cost of capital. Otherwise, the industry becomes a wasting asset. The duty to pursue a sensible business course is owed to the railroads' major stakeholders: its owners, its employees and its shippers. That duty is to make a profit,

and to assume no unreasonable risks. Through such landmark measures as the Staggers Rail Act, Congress has indicated its accord with this premise.

The railroads will, however, be willing to work with public authorities to ascertain those corridors over which high-speed rail passenger service can compatibly be accommodated with their principal business: the movement of freight. It is important to ensure that decisions regarding compatibility be made on a case-by-case basis. Capacity and operating constraints vary considerably over segments of the nation's railroads. In some cases, collocation will simply not be possible. In these instances, other avenues may be explored, such as sales of rail rights-of-way and relocation of operations, or grants of easements alongside the existing railroad.

If collocation is possible, the railroads, as landlords, and the sponsoring passenger authorities, as tenants, will be free to negotiate the terms of their contracts at arm's length.

S. 839 WILL REQUIRE MODIFICATION TO ENSURE FAIRNESS AND FEASIBILITY

The Administration Bill, S. 839, offers great promise in bringing American rail passenger service into line with its European and Japanese counterparts. The emphasis the Bill places on planning is particularly commendable, since past efforts have all too often been characterized by good, but haphazard, initiatives.

High-speed trains will not run, however, on existing rights-of-way owned by freight railroads unless Congress addresses basic concerns.

Indemnity and insurance. The Policy Statement stresses a critical point:

Freight railroads must be indemnified and insured against any and all financial liability arising from accidents affecting passenger service.

Amtrak's President, Mr. W. Graham Claytor, Jr., has referred to:

* * * the legitimate concerns of freight railroads about potential passenger injury claims resulting from Amtrak future high-speed operations over their tracks. Clearly, the potential cost of an unfavorable jury award as a result of a passenger train accident could easily exceed (many times over) the revenues * * * [derived from the service]. (Testimony of W. Graham Claytor, Jr., Subcommittee on Transportation and Hazardous Materials, Committee on Energy and Commerce, U.S. H.Rep., April 29, 1993.)

No more dramatic focus could be given the point than the precedent of the tragic 1987 Chase, Maryland incident. There, Amtrak contested its obligation to indemnify the freight carrier, Conrail, on the grounds that its employees had been guilty of more than ordinary negligence. As a result, Conrail incurred liability of \$134 million—a loss which Conrail could not recoup out of passenger contract earnings for centuries.

No single freight railroad would be willing to enter into a high-speed rail contract unless it is fully protected against a Chase recurrence. A group of railroad counsel have concluded that other than recourse, state-by-state, to legislative or constitutional measures, federal legislation will be necessary to resolve the problem in a practical manner. Even state action might not, as a practical matter, be sufficient. For example, State A could alter its laws, if necessary, to limit liability in an accident or to eliminate punitive damages. Absent some federal expression of judicial policy, however, a passenger or other person injured as the result of high-speed operations could nevertheless bring suit against the railroad in State C, a forum that might not necessarily honor the limitation on recovery imposed by State A.

The railroads would be pleased to work with Congress to resolve the problem. They do not desire to dictate the timing or the terms, but they would be remiss not to note that a solution is a condition precedent to the operation of high-speed passenger trains over their rights-of-way. Without a solution to the liability problem, the Bill can only be viewed as a planning mechanism.

High-speed rail contracts should be independent of the strictures of the Rail Passenger Service Act. Outside the Northeast Corridor, Amtrak service operates over privately-owned railroad rights-of-way. The rights of the parties are regulated under Section 402 of the Rail Passenger Service Act, for mainline operations, and Section 403 of the same law, for service requested by State, regional or local agencies (45 U.S.C. §§ 562-563 (1988)).

Amtrak service is not compensatory for the freight railroads; but for historical reasons, the contracts would be deemed confiscatory. However, the Rail Passenger Service Act reflects an option tendered to the freight railroads to join the Amtrak network in exchange for being relieved of passenger deficits which, in 1970, were costing them \$868 million in today's dollars. That relief, plus a "contribution" of some \$800 million, in today's values, was part of the statutory bargain which the railroads accepted. The railroads accepted the offer and contract passenger service

is relatively insignificant, amounting to some \$95 million annually, less than one-half of one percent of their annual revenues.

High-speed rail offers no quid pro quo for America's railroads. In essence, high-speed rail improvements do not benefit freight service. The General Accounting Office recently estimated the cost of bringing a 200-mile corridor to 125 mile-per-hour speeds. AAR's review of the GAO estimate shows virtually no values transferable to freight operations. For example, as the Policy Statement indicates, much of the technology needed—cab signals and speed control—are not necessary for freight operations, but are indispensable in a high-speed passenger operation.

Thus, there is no "bargain" to tender and railroads should be treated in the same manner as engineers, construction firms and equipment manufacturers; all are private businesses entitled to freedom of contract.

It is indifferent to the freight industry whether Amtrak or some other entity be the operator of choice. However, in either case, the legislation should emphasize that service is not being conducted under the Rail Passenger Service Act.

In this regard, Section 1001(d)(10) of the Bill needs modification. It provides that "the support of any owners and operators of existing rail facilities" shall be only one of several criteria for designation as a high-speed corridor. Further, even this diluted criterion would not apply to corridors entitled to automatic designation—upon proper application—under Section 1001 (e) and (f). The "support" requirement is absent in Section 1002, dealing with Master Corridor Plans. It is only one factor to be considered in the grant of federal financial assistance (Section 1003(g)).

Public resources should not be devoted to chimerical pursuits. No corridor should be designated unless the sponsoring authority has a contract (or other bilateral understanding) with the "landlord," the owner of the right-of-way. Further, no project should be eligible for funding unless the corridor master plan configured in Section 1002 contains a description of the agreed-upon contractual terms with the underlyer.

The Bill should permit funding without restriction for grade crossing separation. The recent decision of the Supreme Court in *CSX Transportation, Inc. v. Easterwood*, No. 91-790, (April 21, 1993) emphasizes another area of considerable importance: the elimination of accidents at highway grade crossings. Based on Amtrak's experience, its President has testified that:

All highway grade crossings over which trains will operate at 100 mph or more should be closed or eliminated by overpasses or underpasses. (Testimony of W. Graham Claytor, Jr. supra.)

Research may develop technology, such as that being used in Sweden, which is an equally efficient safety surrogate to grade crossing separation. Unless that avenue is found feasible, AAR respectfully submits that no level of funding for high-speed rail corridors can be deemed sufficient unless the total elimination of grade crossings is eventually assured.

In this respect, the proposed Bill seems unduly restrictive. Section 1003(c)(4) would limit federal funding under its terms to

private highway-rail grade crossings (including payments to property owners to close crossings where appropriate) not eligible for funding under sections 130 and 133(b)(4) of title 23, United State Code. * * *

This comports with the concept that funding under the Bill should be limited to those improvements "not eligible for funding under other Federal transportation programs. * * *" (Sec. 1003(c).)

It is not to cavil with the concept, though, to suggest that grade crossings are different. The section-by-section analysis accompanying the Bill notes that grade crossing funds apportioned to the States under the Surface Transportation Program (another Federal transportation program under the terms of the Bill) can be earmarked for a high-speed corridor only if such use "does not affect a State's assessment of its safety priorities." AAR agrees with that last injunction, but suggests that the result will be inadequate funding for a critical element of any successful corridor. Funding should be permitted for any grade crossing project, whether or not it might be eligible under other programs. That modification would further ensure that a State did not seek to alter its safety priorities to facilitate development of a favored corridor.

HIGH-SPEED RAIL SHOULD NOT BE CROSS-SUBSIDIZED BY FREIGHT SHIPPERS

Attainment of high-speed rail passenger service will, by all admissions, be expensive and the competition for funding will be keen. This hearing affords AAR the opportunity to express its concern that freight railroads in some fashion assist in that financing. In other proceedings, for example, it has been suggested that the diesel fuel excise tax imposed upon railroads for deficit reduction be diverted to high-speed

rail improvements.¹ Other suggestions have been made that railroads "contribute" some portion of the value of improvements made for high-speed use by reducing proportionately compensation due them for use and occupancy of their facilities.

Such suggestions flow from bad facts and erroneous policy analysis. They must be resisted.

As noted earlier, improvements in aid of high-speed service are unnecessary to assist railroads in their principal business—the movement of freight. Any concept of "contribution" cannot avoid condoning cross subsidy. And cross-subsidy of passenger service has brought this industry perilously close to nationalization in the past. The matter was well put almost 40 years ago by former ICC Commissioner Richard F. Mitchell when he observed:

Who pays for the passenger [train] deficit? * * * The coal industry has figures to show that the coal people of the nation pay 7 percent more than would be necessary if it were not for the passenger deficit. That, of course, is also true of the farmers and other shippers throughout the nation. 22 ICC Prac. J. 187, 192 (1964).

The industry's shippers should not be asked to revisit that precedent. The issues posed here are difficult of solution. But, if they are resolved with fairness, the public benefits to the quality of life in America are enormous. To that end, America's freight railroads pledge their cooperation.

A POLICY STATEMENT OF THE AMERICAN RAILROAD INDUSTRY

AMERICA'S RAILROADS SEEK TO ENHANCE PASSENGER SERVICE

Greater use of railroads will permit America to alleviate highway and airport congestion, decrease dependence on foreign oil, reduce pollution, and eliminate injuries and fatalities associated with automobile and truck transportation.

In both urban and rural areas, highway congestion is growing, and many airports are taxed well beyond their design capabilities.

In some areas, railroad rights-of-way offer already assembled corridors that can be utilized without the cost and environmental degradation associated with highway and new airport construction.

The public interest favors increased reliance on rail service. Railroads are substantially more energy efficient than any form of highway transportation; and energy efficiency implies less air pollution. Railroads are far safer than highway to move both passengers and freight—and the railroads' safety record has improved over the past 10 years.

For these reasons, policy makers support greater use of railroads to move both passengers as well as freight; similarly, many policy makers support the introduction of high-speed rail passenger service as a national priority. In fact, the High Speed Rail Association has identified more than 40 candidate high-speed rail corridors in the United States and Canada.

America's freight railroads are ready to cooperate in the advance and introduction of high-speed rail passenger service.

Admittedly, technological and operating differences between various forms of railroading sometimes impose limitations on the shared use of some track. As America moves to increase its use of rail to move both passengers and freight, high-speed rail initiatives must be considered on a case-by-case basis to determine their compatibility with existing train operations.

America's freight railroads are prepared to continue their history of cooperation in identifying and solving engineering and operational difficulties, and in assisting public policy makers to reach economically sound choices.

DIFFERENCES IN PASSENGER OPERATIONS MUST BE ANALYZED

Many potential high-speed corridors do not appear to have the potential ridership economically to justify dedicated rights-of-way, and therefore may seek to share trackage with freight operations.

Launching mixed freight and high-speed rail passenger service on the same tracks must, of course, be accomplished without compromising safety or interrupting the efficient movement of freight.

The concept of shared use requires an analysis of the four distinct rail passenger services that might share rights-of-way with freight railroads:

¹The tax was imposed in the Omnibus Budget Reconciliation Act of 1990 as a matter of competitive equity when a 2.5 cents-per-gallon tax was levied against truck users for deficit reduction.

1) *Commuter rail* provides mass transportation between suburbs and core cities and within combined metropolitan areas. Commuter rail is the fastest growing segment of rail passenger service, and includes lines operated by regional transit authorities (New Jersey Transit, South East Pennsylvania Transit Authority, Metro North, Long Island Railroad, and Metra) or for such authorities by contract (Amtrak, Burlington Northern, Chicago & North Western, and CSX).

2) *Amtrak* is a federally owned company that operates coast-to-coast, primarily on rights-of-way owned by freight railroads, and at top speeds ranging from 79 to 90 mph, depending on the availability of cab signals.² Apart from its conventional trains, Amtrak owns the right-of-way in the Northeast Corridor between Washington and Boston. Between Washington and New York, Amtrak operates high-speed rail passenger service at speeds up to 125 mph.

3) *High-speed rail passenger service* is well established in Europe and Japan, and operates at speeds of 100-150 mph between cities generally fewer than 300 miles apart. Federal funding will permit Amtrak to extend its high-speed corridor from New York to Boston. Joining city pairs such as Washington-New York and New York-Boston will result in high-speed service in a corridor of some 500 miles length.

4) *Ultra high-speed rail passenger service* includes the French TGV and Japanese Bullet trains that operate at speeds at or above 150 mph. Ultra high-speed rail requires new rights-of-way entirely dedicated to this kind of service. It also includes transportation systems using magnetic levitation technology. Except for existing rail lines that are or may be abandoned, it is doubtful that the freight railroads have any assets appropriate for the development of ultra high-speed rail passenger services.

In integrating these types of rail passenger services into rights-of-way owned and maintained by freight railroads, planners and engineers must focus on four key areas:

1) *Significantly Different Operating Speeds:* High-speed passenger trains travel between 100 and 150 mph, while the speed range of freight trains generally is 30-60 mph. This difference of speed constrains the scheduling of freight operations, or requires construction of additional track capacity. Accommodation may not be feasible in all cases.

2) *Signal Systems:* Generally, signal systems for America's freight railroads are visual trackside systems. High-speed rail passenger operations require speed control and cab signals.³ Most freight trains, because of their slower operating speeds, do not utilize speed control, and not all freight railroads utilize cab signals. Therefore, additional investments will be required where high-speed rail can be operated over existing rights-of-way.

3) *Right-of-Way Protection and Grade-Crossings:* High-speed rail passenger operations require total rail-highway grade-crossing protection, which generally means the construction of highway underpasses or overpasses to prevent highway traffic from crossing a rail line at grade. Additionally, high-speed rail corridors may require special protection such as fencing to prevent trespassing and vandalism.

4) *Maintenance Requirements:* High-speed rail passenger maintenance requirements are substantially greater than those for freight operations. Obviously, ride quality is paramount, and for safety purposes more visual inspections are necessary. In curves, track elevations vary with speed, and this constraint may further limit the areas of compatibility.

PASSENGER-FREIGHT PARTNERSHIPS REQUIRE CASE-BY-CASE REVIEW

Because local circumstances and rail transportation goals vary by region, each passenger service project must be evaluated on a case-by-case basis. While passenger and freight operations can be compatible on the same track, the differences between freight railroad service and ultra high-speed rail passenger service create obstacles that cannot be overcome. In other areas, the potential depends upon the facts.

² Cab signals allow for continuous display in the locomotive cab of upcoming trackside signals. Cab signals allow the locomotive engineer to adjust speed promptly, rather than waiting until the next trackside signal is in view.

³ Cab signals are defined in fn. 1. Speed control is a system that detects an overspeed condition by the locomotive and automatically gives an audible warning. If the locomotive is still not operating within the speed restrictions within 25 seconds, the train automatically is brought to a halt.

Recently consummated projects involving commuter rail in Los Angeles, Houston, Denver, Salt Lake city and Northern Virginia are evidence that joint-use agreements can be made that are beneficial to all participants.

After the facts are known, the nature of the partnership between the freight railroad and the passenger service proponent can be assessed. The partnership must be on a business basis. Railroads no longer bear entrepreneurial risk for passenger operations and will enter the arena only on a fully compensatory basis.

It is therefore a matter of equity that the full costs of changes necessary to accommodate high-speed rail passenger service be borne by the public entity sponsoring the high-speed rail passenger project.

Where mixed freight and high-speed rail passenger operations are feasible, leases, parallel easements and/or trackage rights agreements should be negotiated in an arm's length manner.

Another matter of importance is liability in the event of accidents. Freight railroads have no incentive to allow high-speed operations on their lines if they must accept potentially catastrophic, uninsurable financial liabilities. Thus, the freight railroads believe equity demands that they be indemnified against any and all financial liability in the case of passenger operations.

Senator EXON. Thank you, Mr. Harper.

Mr. Buchanan, we are delighted to have you here today. Please proceed.

STATEMENT OF DONALD C. BUCHANAN, DIRECTOR OF RAILROAD WORKERS, SHEET METAL WORKERS INTERNATIONAL ASSOCIATION; ACCOMPANIED BY WILLIAM G. MAHONEY, COUNSEL, RAIL LABOR EXECUTIVES' ASSOCIATION

Mr. BUCHANAN. Thank you.

Mr. Chairman, we appreciate this opportunity to present our views on this very important legislation, S. 839, which we support.

I am accompanied this afternoon by Mr. William G. Mahoney, counsel to the RLEA.

Senator EXON. We are glad to have Mr. Mahoney back. Once again, he is a familiar face. He has been here almost as many times as Mr. Claytor.

Mr. CLAYTOR. And for about the same length of time. We have worked together for years. [Laughter.]

Mr. MAHONEY. I am the second oldest man in this room. [Laughter.]

Mr. BUCHANAN. I have to sit between them. [Laughter.]

The development of high-speed rail passenger travel has proven its value in the Northeast Corridor, both in terms of relieving congestion at airports and in our airways and the ease and comfort that such travel provides our citizens. But from the point of view of the rail worker, it has had an added benefit. It has provided secure jobs for railroad employees.

Development of high-speed rail corridors would also provide additional much needed jobs at a time when employment in the railroad industry is at its lowest point in its history, following a decade or more of record job abolishments.

Rail workers with 15 to 20 years of seniority find themselves at or near the bottom of their seniority rosters. This means that they will be the first to feel the next job cuts. Today there are thousands of rail workers on furlough. Many of these people are highly skilled, and if they are working at all, have jobs that either cannot fully utilize their railroad skills or cannot use them at all.

The development of high-speed rail corridors can utilize the acquired skills of these workers in construction, maintenance, and op-

eration. This will be so regardless of the technology employed in the development of these corridors. But when we consider the budget constraints under which we must work today, it would seem logical to conclude that the possibilities favor steel wheel on steel rail technology as a basic technology, or at least the initial technology for use in high-speed rail corridors.

The workers with the skills to build, maintain, and operate that type of technology are available. With a minimum of retraining and, in many cases, no retraining at all, these workers can begin that work now. The Congress has had a great deal of experience in enacting bills which provide financial assistance in the development of various aspects of our Nation's transportation complex.

When Congress has enacted such legislation it has made certain that the funds provided are not used to undercut the earning capacity of employees in localities where the funds are used, that the implementation of the programs provided do not injure workers in terms of their compensation or their statutory or contractual rights, that the funds are not used to deprive employees of their work by subcontracting it to others, and that those who perform railroad work, whether it be operations or maintenance, or governed by Federal railroad labor and safety laws.

We ask that the Congress provide the same consideration for employee interest in this financial assistance legislation as it has in earlier and similar legislation. We believe that S. 839 was designed to retain for the Federal Government a strong oversight role in the development of high-speed rail, as well as to encourage State, local, and private participation. These are goals which we support.

Rail labor has had many and very serious differences with Amtrak over the past 6 or 8 years, but, despite that record, we believe that Amtrak is the logical choice to oversee the development and operation of at least the initial corridor. We reach that conclusion because of Amtrak's national presence and its experience with the successful Northeast Corridor.

Our country now has the opportunity to begin a process that will greatly improve the quality of life for millions of our citizens. I appreciate the chairman's comments earlier about the railroad retirement system, because I have been a participant in that system for 20 years and I still have about 17 years to go. All of us appreciate your concerns and your knowledge that we need to be careful about any changes in railroad passenger service that would affect that very important system.

I thank you for your kind attention and for allowing us to present our remarks.

[The prepared statement of Mr. Buchanan follows:]

PREPARED STATEMENT OF DONALD C. BUCHANAN

My name is Donald C. Buchanan. I am a member of the Railway Labor Executives' Association and Director of Railroad Workers of the Sheet Metal Workers International Association. I am also a member of the High Speed Rail/Maglev Association and have been for six years. The RLEA is an unincorporated association of the chief executives of the standard national labor organizations representing the railroad employees on all of the Class I, and many of the Class II and III, railroads in the United States. A list of the organizations affiliated with RLEA through their chief executives follows:

American Train Dispatchers Association; Brotherhood of Locomotive Engineers; Brotherhood of Maintenance of Way Employees; Brotherhood of Railroad

Signalmen; Hotel Employees & Restaurant Employees International Union; International Brotherhood of Boilermakers And Blacksmiths; International Brotherhood of Electrical Workers; International Brotherhood of Firemen and Oilers; International Longshoremen's Association; Sheet Metal Workers' International Association; and United Transportation Union.

Before presenting the views of the RLEA and its affiliates on the issues before this Committee, I want to convey our appreciation at being given this opportunity to express those views to you and to commend this Committee and its chairman for convening this hearing which evidences their concern for the development of intercity passenger transportation which will significantly impact the future well-being of our country.

High-speed rail represents the future of short and medium distance business travel in the United States and, if appropriately developed, the future of much of all rail passenger travel in this country. The RLEA supports that development. We support it not only because it means jobs and job security for our members but because its development will improve enormously the general welfare of all our citizens and because with an ever expanding population high-speed rail will be an absolute necessity if we are to avoid the over-saturation of our highways, airways and airports with its attendant destructive effects upon future federal budgets. We support S. 839 for these reasons.

I am very proud of the significant part played by the rail unions of this country in the preservation of rail passenger transportation by the creation and maintenance of Amtrak. Without the existing intercity rail passenger base that now exists nationally and the developing Northeast Corridor, I doubt that we would even be considering high speed rail corridor development. Without the continuing efforts of our unions and the sacrifices of their member-employees of Amtrak, that intercity rail base and the Northeast corridor would not exist because by 1970 rail passenger service throughout this nation had deteriorated to the point where it was to be avoided if any alternative means of travel was available. No one wanted it, least of all the private railroad companies that were reluctantly supplying it. It was saved by the Congress through its creation of Amtrak in the enactment of the Rail Passenger Service Act of 1970. But Amtrak had inherited a corpse and its revivification of that body was to be a long and very difficult process.

Some private railroads were uncooperative in servicing Amtrak equipment and in providing precedence for Amtrak trains. Many in the Congress fought Amtrak's creation and continued to oppose every dime of funding it received over the years. The Reagan Administration zero-budgeted Amtrak; the Bush Administration budgeted wholly inadequate amounts and even supported its privatization in part.

Because we now have a basic intercity rail system in place and the example of a successful high speed corridor operation in the Northeast, we can look to other city pairs to determine where high speed rail might complement the short and medium distance transportation of passengers in order to relieve highway and airport congestion.

The public benefits attendant upon the development of high speed rail corridors are reflected in the success of the Northeast Corridor Project that has so improved transportation between Washington and New York City and will soon be fully developed between New York and Boston.

But beyond the overall public benefits to be realized from improved transportation, and therefore commerce, between major city pairs throughout the country, is the benefit which development of high speed rail would bring to the railroad and other workers of this country. It is no secret that employment in the railroad industry has dropped precipitously over the past 12 years. Today we find many workers with 15 to 20 years of seniority near the bottom of their seniority rosters: the first to go when the next job cuts are made. These people, in many instances, are highly skilled but their skills are specialized skills fully useful only in the operation of railroads.

Today, the railroad industry has thousands of such workers on furlough performing work in outside industry; work that is wholly unrelated to their railroading skills. The development of high speed corridors could utilize these skilled workers who would require very little retraining to build, maintain and operate high speed corridors just as they built, and now maintain and operate the Northeast Corridor.

The development of high speed rail with the manufacture of high speed trainsets in the United States, regardless of the country of their design, will add to skilled and unskilled employment in this country which provides, in our view at least, additional grounds for support of S. 839 or very similar legislation.

Setting aside cost and budget considerations, perhaps the ideal high speed rail corridor should be that which is the most technologically advanced. And, if it turns

out our country can afford that type of system, I am sure rail labor will support its development.

If one of the more technologically sophisticated systems, such as magnetic levitation, were to be decided upon there are literally thousands of skilled railroad workers who could be employed in its development and operation. However, given the budgetary realities of the day, it would seem probable that high speed rail corridors would be based upon the steel-wheel-on-steel-rail system that is now in use throughout the country. In that event, the first order of business in the development of a corridor would be the upgrading of existing rights of way—or perhaps dedication of new specific tracks along existing rights of way—and the skills necessary to accomplish that result are now available in furloughed and active railroad workers.

Whatever system ultimately is decided upon Congress should ensure the use of active and furloughed rail workers in its development and maintenance. This can be done by requiring the extension of our existing railroad laws to these projects. Where a railroad is involved as a contractor or when a railroad's right-of-way is being used, its collective bargaining agreement should be applied these projects.

When the Congress developed the Urban Mass Transportation Act of 1964 (now the Federal Transit Act), the High Speed Ground Transportation Act of 1965 and the Rail Passenger Service Act of 1970, among others, it ensured that employees engaged in work undertaken with the financial assistance provided by those Acts were paid wage rates at least equal to those prevailing on similar work in the same locality. In the Urban Mass and High Speed Ground Transportation Acts as well as the Railroad Revitalization and Regulatory Reform Act of 1976 (4 R Act) (Congress' first step toward rail deregulation) and the interstate Commerce Act, the Congress provided compensation protection as well as protection for the statutory and contract rights of employees affected by actions taken pursuant to their provisions. In the 4 R Act and the Regional Rail Reorganization Act of 1973 which created Conrail, the Congress protected employees against the unrestricted contracting out of their work in the implementation of those Acts. In the Rail Passenger Service Act and the Conrail Privatization Act the Congress made those rail entities specifically subject to all federal laws and regulations governing railroad safety and labor matters.

We respectfully submit that Congress should require the same levels of labor standards in S. 839 as it enacted in those earlier enactments in aid of the development of our national transportation complex.

We have an opportunity to vastly improve the quality of life for the millions of our citizens who travel daily between major cities in this country that are only 200 to 300 miles apart. One need only inquire of any of the tens of thousands of Washington-New York corridor travelers who long ago abandoned the airplane and the automobile for the ease and convenience of the fast passenger train to appreciate the beneficial effects of this service.

We should proceed with the development of these corridors now because the time is certain to come when we will be compelled to build them and when that occurs, we may not only be without the reservoir of skilled employees now available, but the cost will be much higher; indeed, so high that it may be more than our economy will then be able to bear.

It seems to us that Amtrak, with its experience in the development and maintenance of the Northeast Corridor and its existing operations between most of the city pairs that will constitute the high speed corridors, that it is today the most logical entity to oversee the development and operation of at least the initial high speed corridors.

It is the RLEA's view that the federal government must retain a strong oversight role in the development of high speed rail. We should encourage the cooperation and contribution of state agencies as well as the input of private companies, particularly in the development of technologies to improve the quality of high-speed systems. We believe that S. 839 is intended to accomplish those ends. However, as indicated above, any legislation in this area must protect the interests of employees and provide that high speed rail operations will be subject to our federal railroad labor and safety laws.

On behalf of the RLEA, its affiliated unions and the railroad workers they represent, I urge you to consider favorably S. 839 and the development of high speed rail corridors and, regardless of the technology decided upon, to require the recall and retraining of furloughed rail workers under rail labor contracts for these projects and the protection of the interests of all railroad workers who may be affected by its enactment.

On behalf of myself and my fellow RLEA members, I wish to thank Chairman Exon and the members of this Committee for affording the RLEA this opportunity

to express our views on the subject which are of such great significance to us and the railroad workers we represent.

Senator EXON. Thank you, Mr. Buchanan.

We will begin the questions now, and I am going to yield now to my friend and colleague from Virginia. The subcommittee has been blessed or cursed this afternoon with a proliferation of former Governors that serve on this committee.

I am very pleased to recognize the former Governor of the State of Virginia, my colleague, Senator Robb.

Senator ROBB. Thank you, Mr. Chairman. I will be very brief. And I appreciate your allowing me to just to ask a question or two before I depart. I do have another engagement that will require me to leave in about two minutes.

May I observe with respect to Mr. Claytor that I am delighted to see him here and in good health, and I will let the personal references in there. Reference was made to several matters that were of concern to me in looking at the legislative package initially, particularly with respect to the liability question that was addressed by at least two of the participants, and I suspect that the Transportation Secretary probably had something to say about it earlier as well.

Another comment was made with respect to the number of pieces of track that would be involved—or the corridors that would be involved and not having so many that we would dilute the resources to the point we could not effectively promote that activity. And I think that also has been addressed.

Mr. Harper, in passing, you made reference to the handout. I was just looking at it. From the handout, it appears that only \$10.3 million in grade crossing upgrades, and continuous weld, \$7.5 million, for a total of \$18.8 million of a \$2.261 billion total cost in terms of the estimates. I am not challenging, but it is just an observation, that things like bridge repair and modification, some of the signalling upgrades would be very beneficial, it would seem to me, to the freight carriers, as well as some of the other things here that might be a part of that.

Is it your view that none of these would have any value to the existing freight railroads if they were done? I would think something as simple as the concrete ties would be, and I notice in your backup material you make an argument for it. Some of these things are simply better, last longer, and are more reliable. Could not some value be attributed to some of the other items on this list?

Mr. HARPER. Let me first state the limitations of the analysis. What the GAO tried to do was come up with a typical corridor. Well, there is no typical corridor.

I think one of the important realizations of those working on this is you have got to look at the corridors mile by mile. Now with respect to the individual items, for example, bridge repair, basically, we feel that the freight rail system in the United States, and particularly those corridors where high-speed rail service might be offered is in very good condition today, presently maintained by the freight railroads. And that upgrading from the status that we have today is unnecessary.

I am tempted by the analogy, let us say you had a football team on a cold day, they might be kept warm by good woolen jackets, but a mink jacket would be nice. It would also keep them warm. But the value added by upgrading from wool does not make a difference whether the team wins or not.

Senator ROBB. I understand that, but I would suggest to you that the analogy I was thinking of was the extended life of the bridges, if nothing else, that ultimately would go into your rate base and what have you in terms of your operating costs.

I am not trying to—I am just suggesting that it seems to be a very small percentage of the improvements and upgrades that would accrue to the benefit of the freight railroads. And I was looking only at the relative percentage, not at the true dollar cost.

Mr. HARPER. I understand your point. I think it is a point well taken and one that should be examined with the specifics of any particular corridor that we are looking at. And this is the thing to do.

I frankly was a little bit surprised myself when the railroaders, people who really know railroading, who work with the association, examined this. And I said, all right, what real benefits would we get from this? What would be the benefits that would come from concrete ties?

And, for example, as they point out, basically they use concrete ties only in relatively special situations, on curves and in some very adverse circumstances. Basically, they are in place. For high-speed passenger service, you do need concrete ties. For freight service, you do not.

And, as a matter of fact, from people more expert than I, I understand that a wood tie might last 30 to 35 years; a concrete tie maybe 40 years.

Senator ROBB. OK. I did not realize their comparable life expectancy was so close.

One other quick question and I will yield. And I thank you, Mr. Chairman.

With respect to signalling at the various crossings. I understand that there is a lack of standardization in this area, that particularly if we got into the high-speed rail that we would have to address—I think, if my memory serves me correctly, there is part of the corridor in which I have a parochial interest—there are some seven different standards in terms of the crossing criteria that are in effect.

Would this require a Federal response? I guess it is directed more to Mr. Claytor, with respect to the high-speed rail and the transportation.

Mr. CLAYTOR. Yes. Let me emphasize first that I want to emphasize what Mr. Harper said, that these generalized allocations are really not worth very much. We can list categories of things that have to be fixed in every place you are going to have a high-speed rail. But categories, not individual items.

Individual items are going to depend entirely on the state of the track at the time you start, what kind of freight traffic there is going to be, how much high-speed traffic is there going to be? You put the whole thing together and then you have got to decide what you have to do. And you cannot do it without a survey of each one.

Now, my feeling that I can give you examples of possible corridors in which none of the changes that are going to be made are really going to benefit the freight railroad in any significant monetary way. I can give you some others in which the benefit would be very substantial.

And I think, our position is, that the railroad needs to be compensated on its net costs, the net costs of doing these improvements. Those improvements that can be shown to benefit, financially benefit the freight railroad, should be credited against what you have to pay.

Now the railroads do not agree with that. But that would be my position. I think that is something we are going to work out. But to me you cannot start off making any firm conclusions about these different corridors in absentia.

Senator ROBB. How about with respect to standardization of signals?

Mr. CLAYTOR. Well, it is not standardization of signals. What you are going to have to have in order to comply with FRA requirements, with which we are in full agreement, you cannot go over 79 miles an hour without a signal system that has either cab signals or automatic train control.

And as a practical matter in today's world, you are going to have the key elements of an automatic train control system in order to run faster than 79 miles an hour anywhere.

In some cases, and in my opinion I could show that the installation of an automatic train control system would be extremely beneficial to the freight railroad. And I can show you other cases in which it would not make the slightest difference, because the traffic is of such a nature that it would not matter.

And that is what we have got to look at in each case. There is no such thing as standardization. What we are talking about is a minimum standard of cab signals and train controls systems that would be necessary for operation at 125 to 150 miles an hour or any speed over 79 miles, as a matter of fact, under FRA regulations.

Now that has got to be done in every case. And in some cases, it may be of no benefit to the freight railroads. In other cases, it may be of substantial benefit. And that is going to depend on the situation.

Senator ROBB. I suspect there will be some differences, Mr. Claytor.

Mr. CLAYTOR. There will be differences on that, but that will have to be worked out. I mean, that is the kind of problem that we face.

Senator ROBB. Gentlemen, I thank you. Mr. Chairman, I thank you. I appreciate very much the opportunity to ask questions before I have to depart.

Senator EXON. Senator, thank you very much. The matter that you delved into was my first question and I am glad that you brought it up, because some of those questions have been answered.

Certainly, I think we should not be starting out, Mr. Harper, thinking the freight railroads are going to pay most of the costs of this new system. Though some people would like to saddle you with

that. You are just getting the freight railroads back to where they are operating at some kind of a return on their investment. I am not looking to the freight railroads to carry the freight or the cost of the program.

I would say, however, that certainly one of the big costs which I think you have in the freight railroad industry are the crossing accidents that I know haunt the railroads time and time again. We talked about that some last night at a ceremony with regard to safety.

So, of all of the items that have been mentioned in the GAO study—I do not know the background of that study—but it seems if you are going to spend \$206 million for grade crossings, it would have to have a beneficial effect to the freight railroads. We could argue all day about the other thing. We set a record last year in emphasis on safety and everybody has to take credit for a part of that. We can even do better.

But certainly, I think you would agree that of all the costs outlined here by the GAO, certainly there would be some, hopefully, direct benefits to the freight railroads if we could improve our grade crossings.

Mr. HARPER. Well certainly there are tremendous benefits from improving and eliminating grade crossings. These are public benefits. Grade crossings, as I know you appreciate, Senator, are an almost unique phenomenon in that we have private property that has been improved and is in current use and there is an accommodation to bring public roads, public highways, and in some places, private roads, crossing that private property.

And indeed, any life saved, any accident avoided is of tremendous public benefit. I think that we could have a long philosophic discussion of how many dollars should be allocated to the account of the freight railroads and how many to someone else. There is no question that eliminating grade crossings and improving grade crossings is a great benefit.

Senator EXON. Thank you. Let me turn to you, Mr. Claytor. Mr. Harper testified that the legislation should be amended to make clear that the Rail Passenger Service Act should not apply to new high-speed services under this program, if Amtrak is an operator of the corridor. The reasoning is that any operating agreement with the freight railroads would be at arm's length. What is your response to Mr. Harper's proposal?

Mr. CLAYTOR. My response is that the Rail Passenger Services Act gives Amtrak a permanent right of access to the freight railroads. And it does not depend upon speeds.

I think that it should not be amended, because there is a provision in here that says that the freight railroads shall be compensated for all of their incremental costs that result from having Amtrak on the railroad and that the ICC may determine, in specific cases, whether they should be compensated for something more than the incremental costs on the grounds of benefits given or received.

Now that is the present statute. I think it ought to be the same. It is going to continue for conventional rail operations. And I think it ought to apply to high-speed rail, too. I do not think it should be amended. So, we are in disagreement on that.

Senator EXON. Thank you. We have some disagreements from time to time. We fortunately have been able to work most of them out.

Mr. CLAYTOR. We are a railroad and we participate. We support the freight railroads and all of their efforts to try to keep the trucks from putting them out of business. And that is a terrible problem for the country, as well as the railroad industry.

We are all together on 90 percent of the things we work on. There are a few things on which we disagree. In fact, I might add there are occasions which two or three freight railroads do not always agree with each other, either. [Laughter.]

Senator EXON. I would—

Mr. CLAYTOR. So that is a problem, but we work together generally.

Senator EXON [continuing]. I would simply remind all that the freight railroads did not eliminate passenger service. There would not be—you would not have a job today, Mr. Claytor.

Mr. CLAYTOR. That is absolutely correct, except my old railroad did not join Amtrak and we kept our own passenger service for quite a number of years. [Laughter.]

Senator EXON. Let us talk about liability for a minute. I would like to address this question to you, Mr. Claytor and Mr. Harper. Both of you have testified that Congress must address the liability issue before the freight railroads can participate in high-speed rail.

I understand that and I agree. What happens if we just leave this to the States to resolve on a State-by-State basis? I assume that it would not be workable?

Mr. CLAYTOR. Well, there are many of these proposed routes that would be multi-State. And our experience in trying to get two States to agree on almost anything like this is that it takes forever, if it is ever done at all.

In a case in which a corridor is entirely within a State and the State provides that there shall be full indemnification or eliminates the tough part of this, which is the punitive damage element in which the sky is the limit on these obligations, Amtrak presently has an agreement with the freight railroads that indemnifies them basically for damages resulting from passenger train wrecks.

The problem has been that there is a question about whether the freight railroad—and we take the position that we are not required to indemnify them for punitive damages against the freight railroad. In other words, if the wreck is caused by gross negligence by the freight railroad and we are prepared to indemnify them for all the compensatory damages for the people who are hurt, but not for punitive damages, because of something that was grossly negligent on the part of the freight railroad.

That is not satisfactory to the freight railroads. And I can see why. They are not getting any profit out of having the passenger train on there. The exposure for punitive damages is almost unlimited and much of it is uninsurable.

And they say, if they are going to have these passenger trains on the line, they have got to be indemnified against the whole thing. Our position is I would be willing to give them the full indemnification, if both they and we are protected against punitive

damages from passenger train wrecks. Because that is the unlimited part of this.

Amtrak, I do not think, could afford to do this. Congress, our appropriation committees, would have a fit if we are suddenly paying \$50 or \$60 or \$70 million for a wreck that is entirely caused by the gross negligence of a freight railroad and we are paying for it and the taxpayers through appropriations are going to have to pay for it. I do not think we can live with that.

But we could handle it nicely if we just had a modest limitation that passenger train wrecks, passengers on passenger trains shall not be permitted to have anything but compensatory damages. That would put a ceiling on this that we could live with. And we could give them the indemnification and let it go.

And that is true of conventional as well as—because this problem exists for conventional—for the future conventional operation as well as high speed. That is why the memorandum I have submitted, which gives an extraordinarily large list of cases in which punitive damages have been especially eliminated in certain categories. This is a small category that we are talking about that would really do the job.

And that, I think, is the easiest and simplest way to do it, if we could possibly get Congress to face it. Now there may be other ways. Congress could provide a Federally funded insurance fund to take care of the situation, which would be pretty expensive for the taxpayer but would take care of the problem of enabling us to go ahead and get on the freight railroad without this problem. Or something else.

But we are prepared to work with this committee and all the other committees that have jurisdiction, because this is a problem that has just got to be solved if we are going to go ahead with this thing.

Senator EXON. Mr. Harper.

Mr. HARPER. Thank you, Mr. Chairman. Mr. Claytor has done a good job of laying out the parameters in this issue of liability. I would, if I may, invite the General Counsel of the AAR, Mr. Robert Blanchette, to step forward perhaps to supplement my comments on it, which would be two.

No. 1, we feel that there is a possibility that even a high-speed corridor operating within a single State could find a diversity of citizenship question which would allow the venue of jurisdiction to go outside of the State, in which case the only way to corral that issue would be through Federal legislation. So, we think there is a Federal question here that needs to be addressed in Federal legislation.

Also, in respect to the issue of the relationship between freight roads and Amtrak on the liability issue, the legislation is permissive that there could be an operator other than Amtrak with whom the freight railroads do not have this kind of legislative framework.

Bob, do you want to supplement those comments?

Mr. BLANCHETTE. Thank you. Mr. Chairman, as usual I will sit to the right of Mr. Mahoney.

Senator EXON. You are sitting to the left as I see it. [Laughter.]

Mr. BLANCHETTE. Well, maybe he has changed direction.

Senator EXON. At least you are sitting together. That is good news. [Laughter.]

Mr. BLANCHETTE. That is a rarity for us. [Laughter.]

This is the case: if there is a State that can indemnify and insure the operator and the underlyer against liability regardless of the degree of fault, that State or a combination of States could solve the problem.

The difficulty arises if the State does not or cannot or will not do so. Some States have a constitutional impediment against indemnifying people for gross negligence. But I would urge the subcommittee to consider the fact that there are two people who should be considered for indemnification. Both the operator and the underlying landlord, or the railroad.

Now, the problem to which Mr. Harper alluded is one where a State does not indemnify or insure, but does something else. For example, the State puts a cap on liability or deletes the remedy of punitive damages. There a passenger or a third person—because you would have to consider third parties who are injured as a result, for example, of a grade crossing accident—could choose a venue other than the State in which the accident occurred.

And that venue, under its choice of laws precedent, might not choose as a matter of its presumed public policy, to honor the accident State's limitation on liability or the accident State's limitation or deletion of punitive damages. There, the freight railroad and Amtrak, if it were the operator, would be at risk.

And the third case is the one which Mr. Harper posited, which is that the operator is not Amtrak and, therefore, whatever you would have done by way of contract with Amtrak would be inoperative.

Senator EXON. Thank you very much. Let me move on now to the last question that I have of this panel. I would tell you that there very likely will be additional questions, and we would appreciate your responding as promptly as you can for inclusion in the record.

Mr. Buchanan, could you explain a little bit more what you referenced in your opening statement in this regard? Please tell the committee about the potential contribution of high-speed rail to the railroad retirement system program that we all have been concerned very much about for a long time.

It would seem that the addition of thousands of new high-speed rail workers could do nothing but help ensure the long-term solvency of the system. Do you agree with that?

Mr. BUCHANAN. Yes, sir, I do agree with that, very much so. In our union and I know in other unions, the growth in our membership has been in Amtrak, and in commuter rail; passenger rail systems like Metra in Chicago, and up in the east Metro North, and on Amtrak. And I see this as the growing part of rail whether it is the inner city or across the country, however we develop high-speed rail.

It is a very important issue because of the continual shrinking of the active number of rail workers in the freight railroads, while the number of individuals eligible for retirement continues to increase. And it is a burden on the Congress, it is a burden on the rail unions and the rail industry to find a way to preserve this fund.

It is very much in the public interest to at least be certain that these individuals who worked all these years on the railroad have their annuities paid when it is time to retire. So, it is a very important issue to rail workers.

Senator EXON. Thank you. I almost hesitate to make this statement, because if I make it it is only fair that I give you a chance to respond Mr. Harper. And that is that in addition to my feelings that grade crossings would have to be improved for high-speed rail, I suspect that there would be some direct or indirect benefit to the railroads with regards to the matters we just discussed with Mr. Buchanan. Certainly, high-speed rail would hopefully have more people working, and therefore relieve some of the concerns that the freight railroads have about the problems with the pension system of the railroad workers. Is that not accurate?

Mr. HARPER. First of all, with respect to the grade crossings, I think Mr. Claytor and I, and everybody else involved in the railroading aspect of this feel with respect to high-speed rail it is elimination of grade crossings, so there are no grade crossings. This is absolutely essential for things moving across the Earth at 100 miles an hour.

With respect to the Railroad Retirement Fund, indeed this is a concern and, if I may be a little facetious, I think everybody working in the railroad industry who is covered by railroad retirement deserves to feel tired at the end of the day because there are 950,000 beneficiaries and only about 230,000 active contributors to the system. So, indeed, those numbers alone give you reason to be concerned.

And anything we can do to bolster that situation is certainly appreciated by all of us potential beneficiaries. Don and I, out in the future, and Bill maybe sooner, if he is eligible.

Senator EXON. You see, we are finding common agreement here as we go along. Certainly I recognize, Mr. Harper, that we have to eliminate grade crossings for high-speed rail, which Mr. Claytor has been preaching to me for as long as I can remember, and I do not want to hear about it again now. [Laughter.]

He has been saying that we have got to eliminate these grade crossings or we cannot have high-speed rail. And I also would say, just so there is no confusion, wherever we go forward with in maglev, there are not going to be any grade crossings. So, that is one of the good things about maglev, although it is obviously more expensive.

Gentlemen, thank you very much for your expert testimony. We appreciate very much your being here. You are excused, and I will now call our second panel.

Mr. Joseph Vranich, the president of the High Speed Rail/Maglev Association. He is from Alexandria, VA.

And the other two witnesses we have I want to especially thank because they have flown here this morning to be part of this hearing.

Dr. Richard J. Gran, director of advanced concepts for the Grumman Corp. Grumman has provided us with a summary of their maglev system concept proposal. And, Mr. Larry E. Salci, president of the Bombardier Corp. of Arlington, VA.

Welcome to you all, gentlemen. All of your statements submitted have been accepted for the record. I would appreciate your summarizing at this point.

Mr. Vranich, we will begin with you.

STATEMENT OF JOSEPH VRANICH, PRESIDENT, HIGH SPEED RAIL/MAGLEV ASSOCIATION

Mr. VRANICH. Thank you very much, Mr. Chairman. I am delighted to be invited back to this committee. It is a pleasure to be here and a privilege to appear on behalf of the High Speed Rail/Maglev Association.

We support the Clinton administration's High Speed Rail Development Act, and we applaud you, Mr. Chairman, along with Senator Hollings and Senator Lautenberg, for introducing this legislation.

This bill can help bring about high-speed surface transportation because it is part of a puzzle that is being put together here in Washington. Another part of that puzzle was put in place through several provisions of the Intermodal Surface Transportation Efficiency Act. A critical third piece of this puzzle would be passage of the tax exempt bond bill as introduced by Senator Bob Graham and Representative Bill Coyne. So, all of these efforts taken together could contribute to high-speed rail development.

We have been trying to create a new form of transportation, and the best way to do that, we think, is through a strong grant program as part of this package. A grant program where innovative, focused proposals would compete for Federal funding under stringent grant guidelines.

Our association is on the record as favoring incremental work that is judicious and brings about meaningful time savings to the traveling public. But, we find it necessary to express caution.

A quick look at the past is worrisome. Virtually every Amtrak train out of Chicago is slower today than the trains were 30 to 50 years ago. Even after millions of tax dollars were spent to upgrade tracks between Detroit and Chicago, the fastest Amtrak train between those points takes 5 hours and 15 minutes, one-half an hour longer than the schedule was in 1936.

A look at proposals for the future also is worrisome. Washington State proposes to spend more than \$266 million per incremental improvements under this act. Upon completion, however, the schedules between Seattle and Portland, OR would be only 4 minutes faster than they were 22 years ago. Such trains failed to draw multitudes of passengers 22 years ago. There is no evidence to suggest they would be any more popular today.

Now, the purpose in addressing this concern is not to object to incremental improvements, but to clarify that they alone, we believe, will prove inadequate. It is vital that the grant process require that incremental improvements be a component of master plans from the States, and that they not be the sole component. It should be required that incremental improvements be the first phase of a detailed, focused, long-term approach.

At a minimum, Federal guidelines should require that a grant proposal commit to high-speed trains that are at least equal to

what has been offered in Europe for the last decade, or in Japan for nearly three decades.

Regarding magnetic levitation trains, we need to get to what I call the ignition stage on a maglev prototype program. Since it appears that the funding level in this bill is insufficient, we would encourage additional investment through the defense conversion program of the Advanced Research Projects Administration.

The committee requested comment on the appropriate role of Amtrak in high-speed programs. We have always been supportive of Amtrak, but this association also has always stood for competition in steel wheel and maglev systems. For example, a franchise process would permit the best contractor available to operate new high-speed systems as well as existing routes that may become high-speed routes.

USAir has taken an equity position in the Pittsburgh High Speed/Maglev Project. With encouragement, perhaps that airline will become the operator of an eventually built regional high-speed system.

A Michigan railroad is willing to work with the State and U.S. transportation departments to improve and operate the Chicago-Detroit passenger trains.

In conclusion, advanced, high-speed, high-technology ground transport systems offer many public benefits. They can increase mobility, save energy, lower air pollution, and provide exceptionally safe travel all while creating new jobs. But that can be true, we believe, only through a program where truly innovative proposals would compete under some rigorous grant guidelines established in the Department of Transportation.

I thank you for this opportunity to appear here and would be pleased to answer any of your questions.

[The prepared statement of Mr. Vranich follows:]

PREPARED STATEMENT OF JOSEPH VRANICH

Mr. Chairman and members of this distinguished Committee, it is my privilege to appear before you on behalf of the High Speed Rail/Maglev Association to discuss the creation of a new form of transportation for America.

This Association, now celebrating its tenth anniversary, has a diverse membership. We have gained international recognition as the preeminent organization representing those seeking to advance high-speed ground transportation in the United States. We are an "umbrella group" with broad support—more widespread than typically is found in a trade group—because we include a variety of interests, while many other Associations have had difficulty maintaining their membership through the recession, the rolls of this organization kept growing.

This Association supports S. 839, the High Speed Rail Development Act of 1993. We applaud the Administration's vision and we commend Chairman Jim Exon and Chairman Fritz Hollings, and others, for introducing the bill.

SUCCESSFUL HIGH-SPEED SYSTEMS AS MODELS

A first logical question to ask is, "What can we learn from others?" Developments are at a high pitch regarding high-speed systems in other nations.

The most recent development is in Spain. Last year, the Spanish opened a new line for the AVE train—the Alta Velocidad Espanol. Last month, the Spanish increased speeds from 155.3 mph to 167.8 mph. The Spanish enjoy faster train service over the Sierra Morena Mountains between Madrid and Seville than Americans do anywhere.

The French TGV, the world's fastest regularly scheduled train, continues to operate at 186.4 mph to acclaim. Traffic on the TGV Atlantique network increased by 16.5 million in 1991 to nearly 18 million last year. All-new high-speed infrastructure

continues to be built as well as new bi-level TGV trains. Next year, France will inaugurate TGV service over a new line to Charles de Gaulle Airport in Paris.

Also in 1994, the new line between Paris and the English Channel Tunnel will open to TGV trains operating at 200 mph. On a related point, the British government recently approved preliminary plans for a new high-speed link between the Channel Tunnel and London and is prepared to provide "substantial public sector support" to complete it by the turn of the century. In conjunction with the tunnel, this would allow London-Paris train trips of a mere 2 hours, 27 minutes.

Germany operates the high-speed train called the Intercity Express, or ICE train, with great success. New statistics show that after startup of the Intercity Express, the average daily traffic between Kassel and Stuttgart, a line of about 250 miles, increased in 1992 versus the prior year by 49.7 percent. Between Hamburg and Frankfurt, a line of about 340 miles, traffic grew by 44.7 percent; patronage between Augsburg and Mannheim is already higher than the forecast for the year 2000. These trains also now operate in international service to Zurich, Switzerland.

The tilt-train X2000 has greatly increased passenger loadings in Sweden, has operated to public acclaim in test service between New York and Washington, and is now on a tour of selected routes in the United States. The Talgo tilt-train is operating with great success in Spain, as is the Pendolino tilt-train in Italy.

Overall, the Europeans are designing an international web of high-speed trains that will cost \$205 billion. Separately, Russia has formed a corporation to build a high-speed line between Moscow and St. Petersburg. Across the Pacific, projects are on the drawing boards for Korea and Taiwan.

Japan continues to build, the latest being \$1.3 billion in Bullet Train extensions, including a line to Nagano to be ready for the 1998 Winter Olympic Games. The Japanese are introducing new trains that will take 26 minutes out of the already fast Tokyo-Osaka schedules. Traffic growth is so strong that officials may construct a new Tokyo station to boost capacity.

The Japanese Transport Ministry is building its new full-scale test track for its superconducting maglev train design. Progress also is being made on another maglev train, the High Speed Surface Transport (HSST), with partial financing from Japan Air Lines.

The Transrapid maglev system has been certified as having "technical readiness for revenue service" by the German government, indicating that it has passed safety, reliability and other standards. Such a certification is a prerequisite to building Transrapid lines in the United States, in Orlando or Pittsburgh, or in Germany along the proposed Hamburg-Berlin route.

FEDERAL VISION NEEDED

President Bill Clinton went on the record repeatedly during the campaign as being in favor of high-speed ground transportation, saying:

"I strongly support the development of high-speed rail because we need to ensure that we possess a transportation system that boosts American productivity and international competitiveness.

"I think we ought to take defense cuts and invest them in building an economy of the 21st Century, including * * * high-speed rail in particular. A half a million Americans would ride fast trains every day if we built them ... It will create an unbelievable number of jobs and really help our economy. Also, as you know, it will be good for air pollution out there in California and on the East Coast.

"A Clinton Administration will use a portion of transportation funding and possibly funds transferred from defense to create a high-speed rail network between our Nation's major cities. Bullet trains in five major corridors could serve 500,000 passengers a day at speeds up to 300 miles an hour."

Vice President Al Gore, in his book "Earth In The Balance," wrote, "We should be emphasizing attractive and efficient forms of mass transportation * * * magnetically levitated trains should be enthusiastically encouraged."

PUT LEGISLATION IN PERSPECTIVE

Could this bill, standing alone, bring about high-speed train service to the United States? Careful consideration suggests that such a result would be difficult.

However, passage of this bill, combined with several provisions contained in the Intermodal Surface Transportation Efficiency Act (ISTEA), and if followed by the passage of legislation to permit use of tax-exempt bonds, would mean that real progress could be made.

The legislation is a logical step that the Nation must take. We agree with Transportation Secretary Federico Peña that "fast, safe, efficient and convenient intercity

transportation is inseparable from the health of our economy and the general welfare of our country. * * * It is clear that as the economy grows, the demand for intercity travel will also grow."

We know from experience that high-speed rail will develop in the United States only when reasonable Federal Investments are available to match state, local and private investments. While the \$1.285 billion in this bill will be helpful, it should be noted that it is but one-fifth the amount of public dollars being spent on a 7½-mile highway in Boston. I'm not questioning the necessity to build this highway, named the Central Artery, I'm merely offering one example of the disparity in the levels of funding for different forms of transportation.

The challenge is how to put together an effective high-speed surface transportation program for this level of funding. We believe that it can be done through a stringent grant process.

CORRIDOR DEVELOPMENT PROVISION

Regarding the high-speed corridor development effort, we concur that it's time to establish a separate program of Federal financial support to the State and local governments to assist the implementation of high-speed rail systems outside the Northeast Corridor. As with aviation, highways and transit, the new program holds promise of a partnership among the various levels of government.

On a related point, the Committee asked for an "assessment of the incentives proposed under the Act intended to encourage state, local, and private-sector investment in high-speed rail, and whether, given the funding amounts proposed to be authorized under the Act, Federal investment should be concentrated in a limited number of demonstration corridors."

We agree with Kenneth M. Mead, Director of Transportation Issues for the General Accounting Office, that "Because Federal funds are limited, a strategic approach is needed to focus Federal funds, rather than spreading Federal resources across a large number of projects nationwide." With a \$1.285 billion program, funds dispersed too widely will mean that the impact that the expenditures will have on demonstrating the effectiveness of high-speed rail could be so diluted as to be meaningless.

PROVISION FOR GRANT PROGRAM

Our Association does not seek funding authorization for any particular project. The best protection for the taxpayer's investment should come through a strong grant program where proposals would compete for limited Federal funding.

We find the provisions of Section 1001 to be compelling. This section would permit the Secretary to designate corridors eligible for grants based on numerous objective criteria. As one example, the criteria require consideration of "the financial commitments of the State and/or local governments and the private sector to support development of high-speed rail service." The virtue of this requirement is that private financing could be expected to be a larger component of worthwhile projects and a smaller component of risky projects. We ask that this provision be stringently applied. That, combined with other measurable criteria, could ease the Secretary's decision on which grants are most worthy of approval.

NEEDED INCREMENTAL IMPROVEMENTS

The Committee requested views regarding "the potential improvement in rail passenger service anticipated through introduction of high-speed rail outside the Northeast Corridor on an 'incremental' basis."

Our Association favors incremental work that is judicious and brings about meaningful time savings to the traveling public. We were the thirst organization to endorse the Section 1010 provision of the Intermodal Surface Transportation Efficiency Act that led to designation of five corridors as having potential for high-speed service.

We recognize that calling for incremental improvements is easy; implementing them presents numerous challenges. The unresolved questions include how to protect the taxpayer's investment in lines owned by private freight railroads.

We find it necessary to express caution. As one expert at the Federal Railroad Administration recently stated, "Experience has shown how expensive it is to wrest minor improvements from mature systems" because of decrepit infrastructure, unreliable equipment, interfering freight and commuter traffic, desultory maintenance procedures, and traditional management practices.

A look at the Midwest is illustrative. Amtrak trains on short-to-medium distance routes out of Chicago operate on slower schedules than the trains of 30 to 50 years

ago. This is true even on routes where millions of dollars were spent in the last decade for major track rehabilitation programs. Some examples are:

Fastest train on route	Then	Now ¹
Chicago-Detroit	4:45 (1936)	5:15
Chicago-Indianapolis	3:25 (1941)	4:10
Chicago -Carbondale	4:26 (1948)	5:35
Chicago-St. Louis	4:55 (1936)	5:25

¹ Amtrak timetable effective May 2, 1993.

We need to protect against a program that will result in substantial public funds being spent to reduce train schedules by 5 minutes on this route and 10 minutes on that route. After considerable reflection, we find it necessary to express our concerns that half-way measures spread around to numerous routes would be unjustified and could damage the concept of high-speed rail in the United States.

It is painful yet necessary to recognize that after substantial sums are spent, train schedules may be barely better than when Amtrak began operation in 1971. An examination of the Seattle-Portland route is worthwhile. The fastest trains connected Seattle with Portland in 3 hours, 30 minutes when Amtrak was born 22 years ago. In the current schedules, the fastest train takes more time, 3 hours, 55 minutes, to link the same points. Under a new Washington State Department of Transportation proposal to spend \$266.2 million for incremental improvements on this and one other line, the best schedule offered would be 3 hours, 26 minutes—that's only 4 minutes faster than schedules were two decades ago.

Such schedules failed to draw hordes of passengers to the trains 22 years ago. There is no evidence to suggest that they would be any more popular today. We must consider the implications of this fact. One consequence is that the service still would not be competitive with air travel. Thus, the trains will be unable to replace any of the 60 daily Seattle-Portland flights that contribute to costly near-capacity congestion at Sea-Tac Airport.

REQUIRE TWO-PHASE MASTER PLANS

The purpose in addressing this concern isn't to object to the Washington State program but to suggest that it is inadequate. The Seattle-Portland project could be worthwhile if it were restructured.

We urge that the grant process in S. 839 be amended to require that if incremental improvements are a component of master plans that they not be the sole component. It should be required that incremental improvements, if proposed, be the first phase of a detailed, focused long-term approach.

A two-phase Seattle-Portland master plan would state that incremental improvements would be part of phase one. An example of projects in the second phase that would produce a highly successful high-speed line would probably include a requirement that the trains directly serve Sea-Tac Airport (the single largest focal point for intercity travel in the Pacific Northwest), that interline ticketing and baggage transfer with airlines be arranged, that the line be electrified, that train frequencies be increased, and that Seattle-Portland travel times be reduced to 1 hour. Only then will we see the many public benefits that are attainable through high-speed rail.

It is prudent that the Federal government insure that the program will, in Secretary Peña's words, "lay the groundwork for implementation of very high-speed service on new infrastructure in appropriate markets."

TIME FOR ADVANCED TECHNOLOGY DEVELOPMENT

The Committee requested comment upon "current national needs in high-speed rail technology development, along with * * * the maglev prototype development program."

The President's initiative would develop and demonstrate new high-speed technologies and we find that encouraging. We need to complete at least phase one and phase two of the maglev prototype program. Since it appears that the funding level is insufficient, we would encourage the Administration to seek additional funding through the defense conversion program administered by the Advanced Research Projects Administration. We also expect that corporate interests will make substantial financial investments in this effort.

We encourage swift development of maglev for a very important reason—many of our member companies have assembled teams to compete for maglev contracts. Millions of dollars in private funds have been expended. Our member companies cannot wait forever to see further Federal movement on this issue. Fiduciary responsibil-

ities to shareholders dictate that program offices be closed if Federal matching funds are not soon made available. It would be unwise to put additional numbers of America's best engineering talent into the unemployment lines. Therefore, we encourage robust action to put together an effective Federal maglev program.

A maglev program is vital to our long-term technological prowess. We hope the Congress will give full support to Senator Daniel Patrick Moynihan and his colleagues in their drive to develop a maglev program.

TAX-EXEMPT BOND PROVISION

The Committee requested an "assessment of the incentives proposed under the Act intended to encourage state, local, and private-sector investment in high-speed rail."

We applaud the Clinton Administration for its willingness to induce private investment in high-speed surface systems by proposing elimination of the current limitations on the use of tax-exempt bonds. By offering a "menu" of financing mechanisms, the Administration is being smart in leveraging Federal funds to induce private funds.

A measure that we endorse to help accomplish this is passage of legislation introduced by Senator Bob Graham, S. 438, and Representative Bill Coyne, H.R. 928, to remove the barrier to the use of tax-exempt financing for high-speed systems. Specifically, we support removal of the requirement that an allocation under the state volume cap must be obtained for 25 percent of the bonds issued for high-speed train systems. This change will simply put high-speed rail tax exempt bonds under the same rules as airport tax-exempt bonds.

Micah Green, Executive Vice President of the Public Securities Association, testified that one of the most effective ways for the government to assist the development of high-speed rail is through such financing. It's significant that this bond provision also is supported by the Friends of the Earth and other environmental organizations as the kind of wise change in tax policy that can engender wiser decisions relating to our environment.

LOCAL PLANNING

State and local governments, as well as public-private partnerships, have been the leaders on high-speed systems. Activity has been strongest in Florida, Texas, California, Nevada, Ohio and Pittsburgh, Pennsylvania, with activity picking up recently in New York, Maryland and Massachusetts. High-speed rail, although in the embryonic stage, is now being discussed in Michigan, Illinois, Wisconsin, Washington State, the Carolinas, Colorado, Louisiana and Virginia.

Washington has been a follower, not a leader, in developing high-speed systems. (Only one effort, the Northeast Corridor, is a Federally inspired project.) Therefore, we wish to confirm the logic of Section 1002 that requires that state or local public agencies develop corridor master plans. Further, we would hope that agencies experienced in planning large infrastructure projects, such as State Transportation Departments or Turnpike Authorities, will be given such responsibility.

We particularly applaud Secretary Peña's statement that "The Department will look to the States and localities to undertake the necessary planning and feasibility analysis" for high-speed lines. We know of no Federal organization qualified to take the broad view of how to implement these new technologies in a fashion that best meets regional, State and local transportation needs. Further, the quality of planning that regional, State or local agencies demonstrate will be an indicator of whether such parties are truly committed to bringing about high-tech, high-speed systems.

FINANCING PLANNING FUNCTIONS

Today, virtually every other mode of passenger transportation is eligible for Federal assistance in the planning, engineering and environmental-impact analysis phase of a given project. To an excessive extent, private interests have shouldered such costs for high-speed rail.

Section 1002 offers a welcome change by authorizing a Federal contribution up to 80 percent to help carry the financial burden of preliminary engineering and environmental studies for high-speed rail. This represents vitally needed assistance. It should be noted that such assistance has been available to highway and airport planners for many years.

EMPLOYMENT GENERATION

The Committee requested comment on "the projected economic, labor, and competitive benefits to the U.S. of this Federal investment, given the potential for deployment of foreign-designed high-speed trainsets."

A program of corridor development, both incremental and new construction, and new technology development, could create significant employment opportunities throughout the United States.

Thousands of new American jobs could be created through institution of high-speed rail programs. Approximately 85 percent of all capital expenditures for high-speed surface systems are in infrastructure (tracks or guideways, stations, parking lots, electrical and signaling systems, maintenance bases, etc.) while only 15 percent would be expended for the actual trains. It is our expectation that while the trains may be of foreign design, they will be of U.S. manufacture to the benefit of domestic industries. It is for these reasons that Texas AFL-CIO President Joe D. Gunn has endorsed the Texas high-speed rail project, the construction of which could create 100,000 person-years of work, as a "bold and visionary approach."

On a related note, rail labor has concerns about this legislation. We encourage the Committee to give full consideration to the views of the Railway Labor Executives' Association, as filed in a separate statement.

AMTRAK'S FUTURE ROLE

The Committee's letter of invitation requested that we examine the appropriate role of Amtrak in any Federal high-speed ground transportation investment program. This is an interesting question and one that will be increasingly raised.

There is considerable discussion within this community about the question of who should be the service providers in the future. This Association has always stood for competitive concessions and management contracts. Competition, perhaps through a franchise process, will permit the best contractor available to operate systems once built. Competition is the most effective way to insure that operators provide a level of train service that is unquestionably superior to what is available today in terms of frequency, on-time performance, comfort, cleanliness, courtesy to passengers and other factors.

While we might not have all the answers at this time, we believe that competing providers of service ought to be considered for new high-speed systems as well as for existing passenger routes that may become high-speed routes.

According to a recently released World Bank study, when competition was injected into Japan's rail system through privatization, the service improved, ridership increased, better working conditions were provided to employees, railway suppliers received new equipment orders, and new technology efforts were fostered—all while reducing the fiscal burden on the government.

To this end, the Congress should consider a change in language in Section 1003(g) of S. 839 that states:

In determining whether to enter into a financial assistance agreement to fund an element of a program to improve a HSR corridor, the Secretary shall consider * * * commitments by State and/or local government to fund any increases in the operating deficit of the National Railroad Passenger Corporation that result from operation over the HSR Corridor * * *

While Amtrak may indeed be the operator of selected services, this language could be interpreted to mean that the National Railroad Passenger Corporation (Amtrak) automatically will be the operator of such services. Such a presumption is inappropriate.

The Congress should do more to generate competitive interest in providing high-speed rail service by reducing the appearance of this being an exclusionary clause. This can be done by modifying the language as follows:

"the Secretary shall consider * * * commitments by State and/or local government to fund any operating deficit of the service provider that results from operation over the HSR Corridor * * *

Such language would encourage, as the Secretary stated in his letter of transmittal to Congress dated April 28, 1993, "business participation across the spectrum in size and ownership." Pioneers in high-speed rail come in all sizes and from many parts of the nation.

For example, USAir has taken an equity position in the Pittsburgh high-speed train project. It is unknown whether the airline will become the operator of what could become a regional system. However, our Association has always promoted intermodal cooperation and we would applaud action by USAir or another airline to operate high-speed trains.

Another example can be found in a small Midwest rail line. First, it should be understood that Conrail has announced that it is willing to sell its Chicago-Detroit line. The State of Michigan, a potential purchaser, could well seek a new operator. Willing to discuss that opportunity is Kevin McKinney, Chairman of the Kalamazoo, Lake Shore & Chicago Railroad. He stated this week that his company would consider operating Amtrak's Michigan services. This successful provider of excursion and luxury rail passenger services is willing to work closely with the Michigan Department of Transportation to formulate operating and capital plans to boost speeds on the Chicago-Detroit rail line. This operator would provide interline ticketing through a contract to utilize an airline computer system that, incidentally, represents the new type of business that AMR Corp., parent of American Airlines, is seeking.

NORTHEAST CORRIDOR

Related to this grant program, we agree that capital funding for the Northeast Corridor should not be made eligible for the new grant program. We applaud the Clinton Administration request for \$204.1 million for Amtrak's Northeast Corridor that will bring about electrification and upgrading of the line between Boston and New York City and additional improvements south of New York. Such direct authorization and appropriations are warranted because the line already is owned by the taxpayers of the United States. That is a very different situation than exists elsewhere in the Nation.

LONG-TERM FINANCING ISSUES

No transportation service in the U.S. has developed commercially without meaningful participation by the government. Federal involvement has helped to bring about the transcontinental railroads, seaports and navigable waterways, the Pennsylvania Turnpike, the Interstate highway system, airports, air traffic control systems and even new aircraft.

Long-term, we should reexamine trust-fund financing. A report issued last year entitled *In Pursuit Of Speed* by the Transportation Research Board, a unit of the National Academy of Sciences, stated that high-speed ground transport systems could be an effective alternative in corridors where travel demand is increasing, but where adding capacity to reduce highway and airport congestion and delays is difficult. The study stated that no mechanism exists for introducing a new mode based on the savings achieved by reducing the need for more airports and highways or extending another mode's economic life. It suggested that if public outlays for high-speed rail are justified, they could include contributions from the aviation and highway trust funds because users of those systems will benefit.

The aviation trust fund specifically should be opened to allow funding for access to airports for high-speed trains. Airports are intermodal facilities and create significant travel demand within their regions.

Facilities constructed with such funds would be publicly owned and financing of maintenance shops, offices and rolling stock would be excluded. A tax could be placed on high-speed rail tickets at the going rate of tax on airplane tickets, with the proceeds going back into the aviation trust fund.

We think aviation trust fund financing should be limited to construction of infrastructure; purchase of locomotives and rolling stock would be prohibited. This would keep rail on the same footing with aviation.

A NOTE ABOUT EQUITY

It should be noted that we've recommended only those programs that already exist for aviation, or existed during aviation's formative years. I believe they are measured steps designed to put more equity in our transportation decision-making and funding processes.

HIGH-SPEED RAIL WILL HELP AVIATION

From my dozen years in aerospace and aviation, I'm convinced that high-speed trains will become an integral part of aviation's future. It's inevitable that airline traffic will bounce back in a big way. Then, high-speed rail will be even more vital to our busiest corridors. It's possible that, in future years, the airlines may operate the trains.

We need to start building the right kind of infrastructure in the right places. Future airports will be built in outlying locations, but only when they can be connected to cities by high-speed trains. However, in places like New York and Philadelphia, there isn't room for more airports. We should begin to divert corridor travelers to

high-speed trains. We applaud Secretary Peña's desire for more intermodal cooperation, particularly in linking high-speed rail with airports.

It's noteworthy that several airlines are leaders in air-rail services. For example, Alitalia Airlines last summer began operating non-stop trains out of Rome's airport to Florence and Naples. Giovanni Bisignani, Alitalia's chief executive officer, reports that the trains are proving "very popular." The airline admits it may purchase high-speed trains for future expansions. The service is modeled on a successful Lufthansa Airlines train operation.

Pierre Jeannot, chief executive of the International Air Transport Association, said, "I am generally in favor of the high-speed train. One may ask, 'How the devil can a man who devoted his life-long career to the aerial domain start promoting the train?' Well, I do not perceive the high-speed train as a rival of the plane but more as a complement to our North American environment. * * * Train-plane intermodality has already been proven elsewhere in the world."

Important aviation suppliers are getting on board, with companies such as the Grumman Corporation, Hughes Aircraft, Martin Marietta and Science Applications International Corporation (SAIC) now included in our membership.

Airport executives in Miami, Orlando, Pittsburgh, Los Angeles and New York are interested in links with high-speed lines.

ENVIRONMENTAL BENEFITS OF HIGH SPEED RAIL

The creation of high-speed rail systems can stimulate the economy while bringing about environmentally benign transportation infrastructure. The benefits of high-speed rail are thoroughly documented:

Energy Savings: The Nation would benefit by shifting travelers from oil-dependent systems to electrified trains for selected short- and medium-distance travel.

No form of intercity travel is as energy-efficient as high-speed trains. The Edison Electric Institute reports that U.S. powerplants generate only four percent of their electricity with oil. Therefore, a shift to electrified high-speed trains on any one route would benefit the entire Nation.

Reduction in Pollution: Such trains would reduce air pollution in some of our largest urban areas because electrical power plants place far fewer pollutants in the air than the accumulation of individual auto and jetliner exhausts. According to Southern California Edison, studies sponsored by the Natural Resources Defense Council show that electric high-speed trains are up to 98 percent cleaner than the vehicles they would replace.

Land Savings: High-speed trains are high-capacity systems requiring only small amounts of land. Such trains would reduce the "land take" required for an expansion of transport infrastructure (e.g., the land required for the entire French high-speed rail system is less than that required for the Charles de Gaulle Airport in Paris alone).

Safest Form of Travel: High-speed trains are the safest form of transportation ever devised. Such systems have operated in Japan for 28 years and France for a decade. Together, the trains have served more than 3½ billion passengers. Yet, these systems have not suffered a single passenger fatality. If America made transport decisions based on safety alone, it would have high-speed trains in service on a number of high-travel routes.

CONCLUSION

The greatest level of activity on this issue remains at the State level and the grass roots level. Washington has been a follower rather than a leader in this field. The introduction of this bill demonstrates a much-needed change in the Federal approach.

It is worthwhile to again quote Secretary Peña, who said, "The history of intercity transportation in the United States is a history of change. Evolving priorities, technological innovation, and Federal and State government activity have periodically remade the face of the Nation's transportation system, and with it the very character of the Nation itself." We agree that the renewal of the Nation's transportation system must include high-speed surface transportation systems.

Mr. Chairman, I thank you and the Members of this Committee for this opportunity to appear here today. I would like to extend an invitation to you to visit our Tenth International Convention on High Speed Rail and Maglev, to be held in Toronto next week from May 23rd to May 26th. We expect approximately 500 participants who will deal with regulatory, economic, social, environmental, planning, technical and policy issues. Further, an exposition will showcase the technologies available today and in the future.

I would be pleased to answer any questions you may have.

Senator EXON. Mr. Vranich, thank you very much, and Dr. Gran, before I recognize you, let me say that I assume you may be discussing the paper which I referenced earlier, outlining the Grumman maglev design. I would like to ask unanimous consent at this time, and it is agreed, that this will be included in the record following your remarks.

Dr. GRAN. Thank you, Senator. I was going to suggest you not do that. [Laughter.]

STATEMENT OF RICHARD J. GRAN, DIRECTOR OF ADVANCED CONCEPTS, GRUMMAN CORP.

Dr. GRAN. Grumman has been in the transportation business for a long time. As Secretary Peña mentioned back in the 1970's, we were building both maglev and ground effect vehicles that were levitated on cushions of air, and as such we are probably one of the oldest, if 5 years is old, enthusiastic supporters of maglev.

We published the Maglev Technology Advisory Committee—MTAC—report for Senator Moynihan, and that report describes technical issues and benefits associated with maglev that I think are very important. What I have found recently is that there have been a lot of myths circulating about maglev, and I would like to spend a few minutes going through six of these myths and try to give you some facts instead.

The first myth is that maglev is Buck Rogers technology, that it is science fiction and not science fact. Perhaps back in 1917 that was the case, but I think today it is not. The real reason is that we have superconducting magnets today. Superconductivity has really made the potential for maglev into reality.

Grumman's design is a version of the German technology, but it rides on a 2-inch air gap. The reason we are able to get a 2-inch air gap is because of the use of superconducting magnets.

The 2-inch gap makes a very big difference in many aspects of the design, not the least of which is it is less expensive. The four American maglev designs funded by the Department of Transportation were all geared to making the system cheaper.

Our design, in particular, costs under \$20 million a mile. At the last count it was down to \$19 million, and we are continuously pushing to make it cheaper. That is, incidentally, all expenses—the stations, the guideway, the vehicles, the entire infrastructure except for right-of-way, which we assume would use the interstate highway system. It is also a tilt vehicle, so it can navigate the guideway along the highway right-of-way. Tilting is a very important aspect of all of the designs, not just ours.

The second myth is that maglev is too expensive. I think this myth arose because of the fact that both the German and the Japanese technology are variously priced at between \$40 and \$50 million a mile. If that data is your only benchmark, then the perception that maglev is too expensive is correct. This is the reason that neither the Japanese or the German technology has made it into the American marketplace. It just cannot sustain itself.

However, at \$20 million a mile or less, I not only am convinced that maglev can be sustained in the American marketplace, but I am convinced that it could be paid for out of the fare box. Maglev

has the same potential as the steam locomotive. When the first steam locomotive was brought to the United States it was too expensive, but between the years 1850 and 1868, 200,000 miles of track worldwide were laid down and no Government subsidy was involved in laying those tracks—it was all paid for out of the fare box.

I like to compare the railroad to a cash cow, and in fact that was the case. Maglev has the same attribute, actually even better. The reason is, maglev is extremely inexpensive to operate. The electric costs are very low.

Part of the reason, maglev is more efficient and you are not carrying around a heavy locomotive. Our total maglev vehicle, fully loaded with 100 passengers, weighs 130,000 pounds. That is very light. If, as was mentioned before, you cannot go 250 miles per hour unless you elevate the track, maglev is less expensive than steel rail.

If you have to elevate a steel-wheeled vehicle you are talking about building a guideway that could carry 500,000 pounds or more. In that situation steel wheel is more expensive than maglev, far more expensive. You are probably talking close to \$70 to \$80 million a mile for an elevated steel wheel track. If you look at what Washington Metro cost in elevated areas it was close to \$70 million per mile. I think that the myth that maglev is too expensive is just not true.

The third myth is that maglev would require continuing subsidies, and they might be very substantial. Our thesis is that if we cannot demonstrate that maglev can pay for itself out of the fare box, the Government stops. That is an interesting thesis. It says essentially that either way the Government would not spend any additional money after developing a prototype.

The main reason for a maglev prototype is not to demonstrate the technology but to demonstrate the economics; that is critical. If we cannot demonstrate the economics we will never get to a position where entrepreneurs would invest. For this reason, it is crucial that the prototype described in the ISTEA be built.

The fourth myth is that American industry is not interested in maglev and has not put any money into it. By my reckoning, all the companies that are working in maglev have invested at least \$15 million. This, incidentally, is more than the Federal Government has given out as funding.

The fifth myth is that maglev would harm the existing transportation infrastructure. Well, it turns out that maglev fits into a niche, a market niche that is very unique. This niche is the short-haul aircraft market. Short-haul aircraft are extremely inefficient. They use excessive amounts of fuel. Airplanes like to fly at 30,000 feet, and when flying on routes of 150 to 200 miles, they do not go that high. Therefore, they are wasteful of fuel.

When you look at the short-haul market, there is a real market niche for maglev. Because if maglev can charge what airlines charge for short-haul flights, the system would pay for itself out of the fare box.

The sixth and final myth is that improvements in steel wheel technology would provide the same service as maglev ultimately would. As you have already stated Mr. Chairman, there is a tech-

nological limit for steel wheels. The wheel applies about 15,000 psi onto a steel track. Our maglev puts only 15 psi on the guideway. That is 1,000 times less pressure.

Our projected lifetime for maglev infrastructure is 50 years, and so when you integrate life cycle cost into maglev and compare it to the life cycle cost for steel rail, it is significantly less expensive and ultimately would be much more reliable.

Steel wheel can never sustain continuous operation at 300 miles per hour. I think there are a lot of myths that have been used to ridicule maglev. I do not think maglev deserves this ridicule and I hope these facts help dispel the myths.

Thank you, Senator.

[The prepared statement of Dr. Gran follows:]

PREPARED STATEMENT OF DR. RICHARD J. GRAN

The Grumman Corporation was one of the first companies to recognize the potential of Maglev. We began working in earnest on Maglev in 1988, well before Defense Conversion became popular. I am enthusiastic about Maglev because of its potential as a new and exciting transportation mode, and because it exploits the vast government investment in the technical capability of America's Aerospace Industry.

The Maglev Technology Advisory Committee (MTAC) report prepared for Senator Moynihan in 1989 described the potential benefits of Maglev; so it is not necessary to reiterate them today. However, there are many myths that have become associated with Maglev that I would like to spend a few minutes talking about. These myths have led to ridicule of Maglev. This ridicule may be an effective debating tactic, but in my experience facts always dispel myths. I have selected six myths to discuss today.

The first myth: *Maglev is "Buck Rogers" technology—great science fiction but far from science fact.* The facts are that the four System Concept Definition studies funded by the National Maglev Initiative (The NMI consists of DOT—Federal Railway Administration, Army Corps of Engineers, DOE—Argonne National Laboratories, and DOC) have produced American Maglev designs that are superior to foreign designs, and that do not have any significant technical problems. Speaking as one of the contractors, the amount of work that has been done on the design more than convinces me that we can build a Maglev today. I would like to submit for the record a book of 11 technical papers that describes our design. These papers show a level of detail that transcends concept definition, and goes a long way to reducing the ideas to practice. Our confidence in our proposed concept is such that, using our own money, we are in the final stages of the development of a test magnet that we will demonstrate at the end of this year. Our work has convinced me that a technically sound and economically viable Maglev system can be deployed before the end of this decade.

The second myth: *Maglev is too expensive.* The facts are that Grumman's design would cost less than \$20 million per mile compared to \$40 million per mile for the German or Japanese Maglevs. Economic analyses done by us, and independently by the DOT, have shown that at this cost level Maglev could be inserted into at least two corridors in the US (The NE and California corridors) and the system would be entirely paid for out of the fare box. In these corridors, Maglev per seat mile costs would be very competitive with aircraft and rail. In addition, the DOT analysis has also shown that there are seven other corridors in the US where Maglev would sustain operating costs.

The third myth: *Maglev would require continuing substantial government subsidy in both construction and operation.* Since a Maglev system could be completely built from revenues generated by the users, no government money would be required to build the major Maglev systems. After the systems have operated for a while, and these economics are demonstrated, the growth of the system into secondary markets will follow. This is because the cost of operating the system is very low. Once paid for, the operating system becomes a "cash cow" for building additional guide way. This is exactly how the railroad grew. In the years from 1858 to 1869 over 200,000 miles of rail were installed world wide. This spectacular growth was a consequence of the revenues generated by existing right of way. The same thing will happen when Maglev systems are in operation—all at no expense to the government.

The fourth myth: *American industry is not interested in Maglev.* The facts are that the total level of government support for Maglev from all sources has been about

\$13 million. Over the last five years, based on an informal poll I have done, American industry has invested about \$15 million—more than has been provided by the federal government through R&D funding. This level of corporate commitment will continue to grow as Maglev development continues. The provisions of the ISTEA prototype will “jump start” Maglev. ISTEA shows industry that there is government interest, and for this reason it is critical that the Maglev prototype be fully funded.

The fifth myth: *Maglev will harm our transportation infrastructure.* The facts are that Maglev fits into a niche market that is at present poorly matched to the needs. The niche market is trips of 200 to 500 miles, where currently short haul aircraft are used. Aircraft, in this market, are the most intensive, and wasteful of energy of any of the transportation modes. Aircraft like to fly at 30,000 feet—but in short haul service aircraft rarely get above 20,000 feet. At these altitudes, drag is high and engine efficiency is low. In addition, because airplanes used on these routes do not carry many people, these flights must be frequent and consequently contribute disproportionately to traffic delays and congestion. This is the market niche for Maglev. Maglev would operate like aircraft—hub to hub. There would be no stops. If you wanted to go from New York to Washington, you would take the Washington Maglev. If you wanted to go to Philadelphia, you would take the Philadelphia vehicle. Note that this market niche is clearly distinct from the market served by the automobile. Maglev is not designed to take people out of their cars in local markets. The benefits that Maglev provides in the short haul aircraft market are in the form of unproved utilization of energy, reduced pollution, increased access to airports for long haul flights—so much space would be made available that new airports would not be needed.

The sixth myth: *Incremental improvement in steel wheel technology will provide the same service as Maglev.* The facts are that steel wheels pound the rails mercilessly. Maglev has a pressure on the rail that is about 15 pounds per square inch; compare this with the 15,000 pounds per square inch that a steel wheel, at high speed, applies to a steel rail. This is the reason that the steel wheel has reached its technological limit. Yes, the TGV has traveled at 300 miles per hour in a test. What is not said is what that little test did to the rails. In operation the TGV and the Japanese Bullet Trains do not exceed 150 miles per hour. The rails can simply not sustain higher speeds continuously. Maglev would travel at these speeds with little effect on the guide way. The projected infrastructure lifetime for Maglev is 50 years.

An aspect of high speed rail that is often overlooked is safety. To insure safe operation at speeds over 250 miles per hour, the guide way should be elevated or covered. If one has to elevate steel rail, the cost escalates rapidly, and Maglev becomes significantly less expensive. I support improvements in steel wheel infrastructure. However, these should not be viewed as an alternative to the development of Maglev.

Mr. Chairman, this small list of myths and facts are only the tip of the iceberg. There are many other facts about Maglev that convince me that this is a transportation mode for the future. The technology is real.

Most people think that the main thrust of the ISTEA Maglev prototype development program is to demonstrate that Maglev technology is real. This is not the way I see it. The ISTEA prototype will demonstrate that Maglev is economically viable. If the economics that I described, namely that the system can be built for a total cost of less than \$20 million per mile (including all the infrastructure costs except land) then inserting Maglev into a revenue producing corridor—as the ISTEA prototype development program requires—would demonstrate that a Maglev could be built without government subsidy. This demonstration would allow private financing of Maglev lines because it would show investors that the economic models are real. If the Maglev prototype demonstrates economic viability the only role of the Federal government will be to provide Interstate Highway Right of Way and to help with the infrastructure issues. All Maglev development money would come from private sources—just as happened after the B&O demonstrated steam trains in the US. If, on the other hand, the Maglev prototype does not show the economics, Maglev should not be further pursued. One way or another, the Maglev prototype will be the last investment required by the Federal government.

Maglev is an imaginative transportation mode. It uses proven technologies in magnet design, control systems, aerodynamics, and structures. These have been among the strengths of the Aerospace community. It is a way to convert from swords to plowshares.

Maglev is economically sensible. It has an inter-modal market niche that is important. It will stimulate investment, and as a consequence will create many new jobs in manufacturing, engineering, construction, and produce related high technology spin offs.

Maglev solves the energy, congestion and pollution problems created by short haul aircraft. It could pay for itself out of the fare box.

Let there be no more myths—just facts. Let's not deviate from the intelligent and resourceful path defined in ISTEA.

Let's fully fund the Maglev Prototype.

Thank you Mr. Chairman.

Senator EXON. Thank you very much, Dr. Gran. Mr. Salci.

STATEMENT OF LARRY E. SALCI, PRESIDENT, BOMBARDIER CORP.

Mr. SALCI. Thank you, Mr. Chairman and members of the subcommittee for inviting me here today to testify before you.

Perhaps the best place to begin is a familiar story from other U.S. industries. In 1967, a test train was operating on a fairly straight corridor with a top speed of 165 miles an hour. That test did not occur in Japan, or Germany, or France. It was on our own Northeast Corridor with the original Metroliner electrical multiple unit train. These self-propelled electric vehicles are manufactured by Budd Transit of Philadelphia, a company of which I was president for 7 years.

I relate this story only to point out that we had high-speed rail technology in this country more than 20 years ago. However, there was a lack of interest by the major private railroads. America was abandoning development of high-speed intercity passenger rail as well as its urban rail transit investment, while Japan, France, Germany, and United Kingdom embarked on major developments.

Because of the lack of Federal investment in the seventies and eighties in passenger rail transportation, American manufacturers abandoned or left the rail car industry due to a shrinking market and in many cases unfair subsidized foreign competition.

Today, of the 20 largest U.S.-based rail passenger equipment manufacturers, 16 are foreign-owned. However, ownership is not the issue. Plant location, technology access, and jobs are what really count.

It may appear strange to have a Canadian-owned manufacturer acknowledge subsidized competition, but we are not subsidized, and are in the forefront of investing in the United States.

In 1982, we opened a new rail car manufacturing plant in Barre, VT. This plant, which employs over 400 workers, was the first new rail car plant constructed in the United States in over 25 years.

Our investment in the United States reflects a desire to not only meet but exceed the requirements of existing Buy America. We made these investments largely in anticipation of Federal investment decisions. As the Clean Air Act was enacted and the price of gasoline soared in the early seventies, we saw a potential market for new rail transit systems.

I also think it is only fair to point out that our partner in the Texas high-speed rail project and our competitor in many other projects, Morrison-Knudsen, envisions the same opportunity today that we saw in the 1970's. I would suspect that their vision is drawn by the same transit opportunities now embodied in ISTEA and the possibility of high-speed rail becoming a reality.

Employment impacts. With respect to the project I am most familiar with, the Texas TGV project, it is expected that the construction phase of that project alone will provide approximately

30,000 direct and indirect jobs and nearly 10,000 direct and indirect jobs once the system is operational.

I want to emphasize, however, Mr. Chairman that while the Texas TGV project will incorporate French technology, through technology transfer from GEC-Alsthon and the significant U.S. presence of Bombardier Corp., manufacture of the rolling stock will fully comply with Buy America.

Technology transfer is necessary for locomotives and train systems regardless of whether the Federal program pursues the incremental approach or a true high-speed approach. Moreover, the engineering and civil construction, which is by far the largest component of the project's cost, will be performed by U.S. corporations and managed in our case by our corporate shareholder, Morrison-Knudsen.

Let me turn for a moment to the specifics of Senate bill 839, the High-Speed Rail Development Act. Senate bill 839 proposes for the first time direct Federal investment in the development and construction of high-speed rail. The policy change is a significant development and one we heartily applaud. We do have some concerns with the thrust of the bill, however, which seems to singularly advocate an incremental approach to developing high-speed rail in the United States.

The fundamental factor in determining whether or not high-speed rail will be successful in a particular corridor is first and foremost sufficient passenger traffic flow between the terminal points of the corridor. Without this basic element, no amount of investment will result in successful high-speed operation.

The critical factor in successfully implementing high-speed rail is not the distance between two points but the travel time between traveler destinations by competing modes of transportation.

The point here is that making incremental improvements in rail corridors where those improvements do not result in train service that competes with air and auto alternatives in that corridor will improve ridership only marginally and in some cases maybe not at all.

I make this assessment somewhat gingerly, because a very important customer of my company—Amtrak—would be the beneficiary of these improvements, but I have known Graham Claytor a long time, and I think he would agree with this assessment.

I would like to focus for a moment on the issue of whether or not the Federal Government should actively promote the development of very high-speed rail corridors. Recognizing that I am not a disinterested party in the Texas high-speed project, I believe there are very discrete corridors to develop and implement a fully grade-separated system, dedicated right-of-way high-speed rail system capable of operating at sustained speeds of 200 miles per hour plus.

I am not at all suggesting that Senate bill 839 be used to fund the construction of the Texas TGV project or a project similar to it. There is simply not enough money and it is not an appropriate Federal role—quite the contrary. In Texas, we propose to fund the construction, operation, and maintenance of this project through the private capital markets.

Therefore, the appropriate Federal role should be in providing sufficient Federal assistance to leverage private funds to build

these dedicated right-of-way projects. Unfortunately, there are provisions of Senate bill 839 which have the effect of inhibiting this potential leverage.

In testimony before other congressional committees I have advocated many of the elements included in your bill. That advocacy was anchored in the policy initiatives advanced by ISTEA.

The thrust of ISTEA was to eliminate various modal biases with respect to planning and project selection. Provisions of ISTEA were enacted which specifically permit private funds to serve in lieu of State-matched funds.

At the same time, a 50-percent match ratio was proposed in Senate bill 839. Unfortunately, the bill specifically prohibits the enurement of private funds to the State or local match required in the bill.

We would propose, therefore, that private sector funds generated by payments or contributions to a State project from a holder of a franchise apply against the required State match, particularly those funds used to fund planning and feasibility studies, environmental assessments and mitigation, and preliminary engineering work necessary to obtain the confidence in construction costs and schedule.

These are costs the Federal Government has traditionally participated in funding in all other modes of transportation to reach the decision process. This also encourages the private investment envisioned in transportation infrastructure by ISTEA.

A second issue in Senate bill 836 deals with a limitation in the Texas statute which prohibits the use of State funds for construction or operation of a high-speed rail system. The Texas statute, however, does not specifically permit the use of State funds for planning. Nevertheless, Senate bill 839 specifically prohibits the Texas high-speed rail project from receiving any funds provided in the bill, including planning funds, which are eligible items for State participation.

These two provisions of Senate bill 839 create an unreasonable and inequitable situation, and one which we urge you to reconsider. I cannot conclude, however, without offering this assurance to those of you who see this \$982 million authorization mentioned earlier by Secretary Peña and a potential multibillion consumer of those funds being Texas.

We do not seek nor shall we apply for Federal funds to construct, build, or operate this project. We do seek, however, to be eligible for funds under this bill for planning and other Federal mandates to allow private financial markets to judge the feasibility of this project and other potential projects in the United States by either funding the entire construction, maintenance, or any of its operating costs.

I appreciate the opportunity you have given me here and I will be pleased to answer any questions.

[The prepared statement of Mr. Salci follows:]

PREPARED STATEMENT OF LARRY E. SALCI

Mr. Chairman and members of the Subcommittee, thank you for inviting me to testify before you on behalf of U.S. rail manufacturers who are actively involved in providing high speed rail equipment. The scheduling of this hearing is indeed timely, coming just weeks after Secretary Peña's joint announcement with yourself and

others on the Administration's high speed rail initiative. This hearing presents an opportunity to reflect on the President's initiatives and suggest some modifications to it. I applaud your quick action in holding this hearing and appreciate your hearing our views on high speed rail. In your letter of invitation to testify, you asked that I address the various technology and policy issues that a potential federal investment in high speed rail might mean to manufacturers and suppliers of high speed rail technology.

Perhaps the best place to begin is a familiar story from other U.S. industries. In 1967 a test train was operated on a fairly straight corridor with a top speed of 165 MPH. That test did not occur in Japan or Germany or France. It was on our own Northeast Corridor with the original Metroliner electrical multiple unit train. These self-propelled electric vehicles were manufactured by Budd Transit of Philadelphia, a company which I was president of for 7 years from 1982-1988.

I relate this story only to point out that we had high speed rail technology in this country more than 20 years ago, however, there was a lack of interest by the major private railroads, who then operated all inter-city passenger rail services, to invest in passenger rail as an economically viable mode of transport. The reasons were simple, the auto and highway mode was expanding exponentially due to demographics and suburbanization of our large cities. U.S. gasoline prices were and remain 30-40% of world prices, primarily due to investment and tax policy; and jet and regional commuter aircraft became the dominant transport mode for intercity travel beyond 250 miles. In fact, Amtrak was enacted by the U.S. Government in 1971 to relieve the private freight railroads of subsidizing rail passenger services they could not abandon due to the various state's public service rulings of the necessity of public convenience and necessity. Only over the past 10 years, under Graham Claytor's leadership, has Amtrak grown into a modern intercity passenger system.

At the time America was abandoning development of high speed intercity passenger rail, as well as urban rail transit investment, Japan, France, Germany and the United Kingdom embarked on major developments. The Japanese developed the Shinkansen or bullet train that operates at 135 mph. British Rail developed rail service at 125 and France introduced the TGV at 165 mph in 1981. In 1989, the second generation TGV Atlantique was implemented and operates today at 186 mph and the third generation will operate at 200 mph plus. The German ICE was introduced in 1992 and operates at 155-160 mph. Also in the 1980's, 95-125 mph tilt-train technology was introduced and Bombardier's LRC, Fiat's ERT 450, ABB's X-2000 and Spain's Talgo. Bombardier's LRC and Spanish Talgo were successfully tested by Amtrak and the FRA in 1989 in the Northeast Corridor. More recently, the X-2000 has been tested. This technology is designed specifically to negotiate curves at higher speeds with reasonable passenger comfort.

Because of the lack of federal investment in the 1970's and 80's in rail transportation similar to federal investment in highways and aviation, American manufacturers abandoned or left the manufacturing industry due to a shrinking market and unfair subsidized foreign competition. This exit process was accelerated in the 1980's due to the highly overvalued U.S. dollar (250 yen/\$1, 3.40 DM/\$1, 10 f/\$1) which gave foreign manufacturers a 30-40% cost advantage just due to currency. Also, European and Japanese rail markets were closed to U.S. manufacturers yet the U.S. market had no barriers to entry. With foreign markets protected and unfavorable currency exchange rates, American manufacturers were at a competitive disadvantage most could not overcome. Today, of the 20 largest U.S. based rail passenger equipment manufacturers, 16 are foreign owned. Even the Budd Company in the early 80's was owned by a German company. However, ownership is not the issue; plant location, technology access and jobs are what count.

It may appear strange to have a Canadian based manufacturer acknowledge subsidized competition, but we are not subsidized and were in the forefront of investing in the United States. In 1982 we opened a new rail car manufacturing plant in Barre, Vermont. This plant, which employs over 400 workers, was the first new rail car plant constructed in the United States in over 25 years. Our investment in the United States reflects a desire to not only meet, but exceed the requirements of Buy America. We made these investments largely in anticipation of federal investment decisions. As the Clean Air Act was enacted and the price of gasoline soared in the 1970's, we saw a potential market for new rail transit systems. At the same time, cars of older rail transit systems were reaching their design lives and would need replacement. Thus we made investments in buying the passenger rail car technology and assets of the Budd Company (Transit America) and Pullman Technology, UTCD of Canada, and obtained a license to design and manufacture the Mark VI monorail at Disney World in Orlando.

I think it only fair to point out that our partner in the Texas High Speed Rail Project (THSRP), and our competitor on many other projects, Morrison-Knudsen, envisions the same opportunity today that we saw in the 1970's. With some of the recent investments in rail car manufacturing, I would suspect that their vision is drawn by the same transit opportunity we saw in the 1970's as embodied in ISTEA and the possibility of high speed rail becoming a reality through the investments proposed in S. 839.

EMPLOYMENT IMPACTS

I have taken the time to point out the catalysts to what causes manufacturers to invest in this business only to reassure you that the investments you make today in high speed rail will result in jobs tomorrow, not in Europe or Japan, but the United States. In all candor, however, implementing high speed rail in the United States in a timely fashion will require the transfer of foreign technology, but if there is a sustained interest in high speed rail, more and more equipment components will be manufactured in the United States by U.S. workers.

It is also important to point out that a substantial portion of the necessary work elements of implementing high speed rail are associated with civil improvements to rights-of-way such as track improvements, grade separations, and in the case of very high speed rail, building a dedicated right-of-way. All of these tasks would obviously be performed by U.S. workers.

With respect to the project I am most familiar with, the Texas TGV Project, it is expected that the construction phase of that project will provide approximately 30,000 direct and indirect jobs and nearly 10,000 direct and indirect jobs once the system is operational. High speed train technology will utilize many of the telecommunications and aerospace skills which already exist in Texas, but are under utilized. Further, with a vehicle assembly plant proposed to be located in Texas, yet a new rail car plant will be operating in the U.S.

I want to emphasize, however, Mr. Chairman that while the Texas TGV Project will incorporate French technology, through technology transfer from GEC-Alsthom and the significant United States presence of Bombardier Corporation, manufacture of the rolling stock will fully comply with Buy America requirements. Technology transfer is necessary for locomotives and train systems regardless of whether the federal program pursues the "incremental approach" or a true high speed approach. Moreover, the engineering and civil work construction, which is by far the largest component of the project's cost, will be performed by U.S. corporations and managed by our corporate shareholder, Morrison-Knudsen.

Having provided you with a thumbnail sketch of the potential impact high speed rail will have on manufacturing and employment in the United States, I would like to turn to the focus of your hearing today: S. 839, The High Speed Rail Development Act.

S. 839 THE HIGH SPEED RAIL DEVELOPMENT ACT

S. 839 proposes, for the first time, direct federal investment in the development and construction of high speed rail. This policy change is a significant development and one we heartily applaud. We do have some concerns with the thrust of the bill, however, which seems to singularly advocate an "incremental approach" to developing high speed rail in the United States. To be sure, there is a very appropriate role for incrementally improving certain specific corridors across the nation, but incremental improvement as the sole method of attempting to realize the economic and social benefits of high speed rail investment should not be the only solution.

The fundamental factor in determining whether or not high speed rail will be successful in a particular corridor is, first and foremost, sufficient passenger traffic flow between the terminal points of the corridor. Without this basic element, no amount of investment will result in successful high speed operation. The critical factor in successfully implementing high speed rail is not the distance between two points, but the TRAVEL TIME between traveler destinations by competing modes of transportation.

The point here is that making incremental improvements in rail corridors where those improvements do not result in train service that competes with air and auto alternatives in that corridor will improve ridership only marginally, if at all.

I make this assessment somewhat gingerly because a very important customer of my company, Amtrak, would be the beneficiary of these improvements. But I've known Graham Claytor a long time, and I think he would agree with this assessment.

Using the Houston-Dallas corridor as an example, schedule travel time from "downtown to downtown" by air is approximately 172 minutes, by car 256 minutes.

To be a cost effective alternative to both car and air travel, high speed rail improvements will have to provide service equivalent to the 172 minute travel time which air service offers. Evidence of the assessment can be demonstrated even better in the Northeast Corridor where Amtrak service between downtown Washington, D.C. and downtown New York City is equivalent, or many times below, the same travel time by air. This is the driving reason why Amtrak carries more passengers than either of the two air shuttle operators.

Having explored some of the issues associated with incremental high speed rail improvements, I would like to focus on the issue of whether or not the federal government should actively promote the development of very high speed rail corridors.

Recognizing that I am not a disinterested party in the Texas High Speed Rail Project, I believe that there are very discreet corridors that are not only appropriate, but highly preferable routes to develop and implement a fully grade separated, dedicated right-of-way high speed rail system capable of operating at sustained speeds of 200-250 MPH. Understanding the federal budgeting situation our nation faces, I am not at all suggesting that S. 839 be used to fund the construction of the Texas TGV Project or a project similar to it. There is simply not enough money.

Quite the contrary, in Texas we propose to fund the construction, operation and maintenance of this project through the private capital markets. Therefore, the appropriate federal role should be in providing sufficient federal assistance to leverage private funds to build these dedicated right-of-way projects. Unfortunately, there are provisions of S. 839 which have the effect of inhibiting this potential leverage particularly with respect to Texas, which is the most advanced, in terms of project development, high speed rail project in the United States. We believe that some of the provisions of the bill would have a negative effect of leveraging private capital dollars to construct this Project.

Let me explain.

In testimony before other Congressional Committees, I have advocated many of the elements included in your bill. That advocacy was anchored in the policy initiatives advanced by the Intermodal Surface Transportation Assistance Act (ISTEA). The thrust of ISTEA was to eliminate various modal biases by establishing more uniform planning and financing criteria among transportation projects. Provisions of ISTEA, with respect to leveraging federal funds to attract private investment, were enacted in the area of toll road and toll bridge financing by specifically permitting private funds to serve in lieu of state match funds at the same 50 percent match ratio as proposed in S. 839. Unfortunately, S. 839 specifically prohibits the inurement of private funds to the state or local match required in the bill. Thus, it is difficult to realistically attract substantial levels of private investment because there is less incentive at the state or local level to actively pursue privatization efforts.

We have an even more specific concern with respect to Texas where, in the absence of any significant Congressional or federal action on high speed rail, the Texas Legislature undertook a process of issuing a private franchise through State legislation almost four years ago to construct and operate a high speed rail system in the Texas Triangle. As a result of the franchise option chosen by the State, which was awarded two years ago, franchise payments or private funds previously invested, or scheduled to be invested in the future, will not, under the provisions of S. 839, be allocated to the state match as has been the policy in the recent past with respect to highway and transit projects. We would propose, therefore, that funds generated by payments or contributions to a state from a holder of a franchise apply against the required state match.

A second issue deals with specific limitations in the Texas statute which prohibits the use of state funds for construction or operation of THSRP. In all honesty, this prohibition provision was included in the Texas statute after fierce lobbying by Southwest Airlines which fears competition from our project. The legislation does, however, specifically permit the use of state funds for planning. Nevertheless, S. 839 specifically prohibits THSRP from receiving any funds provided in the bill including planning funds which any eligible items for state participation. These two provisions of S. 839 create an unreasonable and inequitable situation and one which we urge you to reconsider. At a minimum, Texas should be given a grace period to allow the Texas Legislature to reconsider the issue at its next regularly scheduled session.

I cannot conclude, however, without offering this assurance to those of you who see a \$982 million dollar authorization and a potential multi-billion dollar consumer of these funds in Texas.

We do not seek, nor shall we apply for federal funds to construct, build or operate this project. Assuming that President Clinton's proposal to remove the state tax exempt bond volume caps with respect to high speed rail projects is enacted into law, we will avail ourselves of that provision. We only seek, however, to be eligible for

funds under S. 839 for planning ridership, feasibility, environmental studies and other federal mandates to allow the private financial markets to judge the feasibility of this project by either funding the entire construction, maintenance and operation costs or rejecting it. We seek federal assistance only in getting us to the point of build or no build, but not beyond.

If there was ever an example of leverage private funds for high speed rail, we think we are a pretty clear example; but without the changes I have outlined, we will not get very far.

Thank you for giving me the opportunity to testify. I would be pleased to answer any questions.

[“The Grumman Maglev Design,” by Grumman Corp. and “High Speed Ground Transportation—Funds Need To Be Focused Under Proposed Legislation,” by the GAO may be found in the committee files.]

Senator EXON. Mr. Salci, thank you very much. I had a question with regard to what we could do on S. 839 that you answered in your statement, so we can save that question, and thank you for bringing it up, because it is one of the problems we think needs examination, and we appreciate your expert testimony on that.

Let me ask you a question, Dr. Gran. You have asserted that the real issue regarding maglev implementation is cost and not technology, and I think that is probably right. If a U.S. maglev prototype, once built, can be put into service for \$20 million a mile, as you assert, how does that compare with the estimates for incremental high-speed rail?

I mean, it is not exactly the same, but it certainly is something that is going to be weighed as we take this limited amount of money, seed money if you will, and try to get more projects going.

Dr. GRAN. I think it is a matter of timing. I do not disagree with incremental improvements to steel rail where appropriate. The real issue, though, is point-to-point travel time. If you do not improve that significantly, you will never recover the incremental money that goes into the improvements.

So, you have to be very careful about your return on investment analysis to make sure that the money you put into a particular incremental improvement has a chance of paying itself back. If you do not, you could be wasting money. If maglev does succeed in a corridor, you would replace steel rail.

The Department of Transportation found two corridors in the United States that could pay for themselves out of the fare box. The Northeast Corridor is one, and the California Corridor is the other, both of which are served by rail right now.

If maglev were put into those markets and they did pay the total system cost, then maglev would supplant rail, and I might add also supplant the short-haul aircraft in those markets. That is not necessarily bad. Rail has a market niche, but I do not think that high speed is it.

Senator EXON. Thank you, Doctor.

Mr. Vranich, let me ask you a question or two. The subcommittee had hoped to hear testimony from the Chicago Metra Transit System, who would have showcased their “buy Chicago” requirement for train car manufacturing. What is your opinion of the Chicago initiative?

I also understand that you have an innovative solution to Chicago’s dilemma over a third airport. Could you explain that the best you can for us, because all of these matters interrelate with

regard to the decisions that have to be made with moving people from point A to point B through various sources of transportation.

Mr. VRANICH. Yes, sir.

First of all, as far as the issue of jobs and Buy America and high-speed rail, let me give you a generality. And that is that in any given high-speed rail project, 85 percent of the total project cost is in infrastructure. And it is remarkably similar in all of them. I think Texas is 86 and Florida is 85. So, these are jobs created, let us say, in the State of Florida for Floridians on infrastructure that is there—the tracks, the guideways, the stations, parking lots, electrical systems, signal systems, the works.

So that is not an issue. What is an issue is the 15 percent that goes into the train sets. Now, it is true that almost all the trains being discussed for high-speed rail in America are of foreign design, but I am absolutely convinced they will be of American manufacture.

Bombardier has relationships, and they can speak for themselves. But I know that Siemens is looking to build trains in the United States. Talgo-Renfe is a new member of the association, and there are others. So, the trains also will be, while of foreign design, I am convinced will be built here. That raises then the question of what percentage U.S. content will there be. That is a specific answer that I cannot give except to relay that all of the manufacturers who are members of our association make very, very clear that they know for high-speed rail to work in the United States that there has to be high U.S. content, and that they will take measures to achieve that.

I do know that several manufacturers are out having confidential discussions with American firms looking for facilities where these trains could be built in the United States—those who do not have such a relationship already established.

Moving on to your other question about Chicago, the interesting thing about Chicago is that the city has been involved in a major fight about the location of a third airport. I agree with Transportation Secretary Peña that it just is not very easy to build a huge new superairport near or in a big city any more.

As a matter of fact, I am so convinced of this that I testified before this committee before when my book "Super Trains" first came out. And I believe that I may have been asked about it then. About 42 percent of all domestic flights serving O'Hare Airport are headed for points less than 300 miles away. One way to make a major contribution to improving aviation is to tie a high-speed rail directly in with O'Hare Airport. And I will give you a quick example.

Today, I believe there are 54 flights between Milwaukee and Chicago. Those people are not going from Milwaukee because they want to visit the Sears building in downtown Chicago. They are going to O'Hare because they are connecting to long-distance flights to Florida, California, and so forth. What I would like to see is a high-speed line right out of O'Hare to Milwaukee, tied in with the aviation system, interline ticketing.

A passenger goes to the terminal in Milwaukee, checks his or her bag, gets to O'Hare, goes from a train to a plane, instead of a plane to a plane, and continues on the trip. Frankly, I would also like to

see these trains run by aviation to really integrate them into the aviation system.

Now, what could lure aviation into this?

Suppose the trains would be only a break-even proposition. Suppose the study that Dr. Gran quoted is correct. What would induce an airline to run these trains?

Well, if the airline were given the 54 slots at Chicago's airport, that could be a major inducement. They could use those slots for the longer distance flights, where they can make more progress. The is the kind of intermodal thinking we need more of in this country. And it is refreshing that Secretary Peña talks that way, and I hope that with new leadership coming in at the Federal Railroad Administration and the Federal Aviation Administration that we could start tying these systems together in a sensible way.

Senator EXON. Mr. Vranich, I could not agree with you more. And I like your advance thinking on this matter. You mentioned, and I know something about it, that you have done some study about the proposal which I believe you said USAir was involved in, in Pittsburgh. It is obvious to me that USAir is involved in it because they are looking into the future, seeing that it will benefit their hub there very much.

As we move forward, it is absolutely essential, as I have been saying for a long time, and I am stating again, here today, that we must think intermodally with regard to a U.S. transportation system. We cannot focus only on a U.S. train transportation system or a U.S. air transportation system. Thinking intermodally, it means looking at the combination of all of the systems that we have. We must recognize that right now, it is obviously a problem if you are going by Amtrak to Chicago and then going to get out to O'Hare—it is a big problem transportationwise.

So, I think the total system concept has to be taken into consideration and very well may be some of the answers to the problems in the future. As a weekly traveler through O'Hare, I wish we could do something about it. In the first place, we should improve the weather in Chicago. [Laughter.]

I still jokingly call Chicago the climate capital of the world, but certainly when I heard about the new airport that they are talking about there I thought, let us try to solve the problems that we have now before we go into that.

In any event, there will be additional questions for the record.

We thank all three of you for being here today. Some of you have traveled a long way, and I know it inconvenienced you. Speaking for the committee as a whole, we appreciate your time and effort. We are looking forward to further input and advice. Please answer the additional questions for the record as quickly as you can.

Gentlemen, thank you. You are excused.

We are adjourned.

[Whereupon, at 3:15 p.m., the hearing was adjourned.]

APPENDIX

PREPARED STATEMENT OF SENATOR SIMON

Mr. Chairman and Members of the Subcommittee, I appreciate this opportunity to offer testimony before the Committee and I want to commend you for holding this hearing on the High Speed Rail Development Act of 1993. Although I have consistently supported the work of this Committee in furthering our national interest in rail service, this is the first time I have had an opportunity to strongly endorse a President's proposal for high speed rail service. This was a promise President Clinton made to American voters that we can all support.

Since I have been in Congress one of my major goals has been to help bring world-class rail service back to this nation. Until now this goal has not had the support of any Administration during my congressional service. In contrast, nations in the European Community and Japan not only have emphasized rail as their dominant form of intercity transportation, but moved ahead, as long ago as thirty years in the case of Japan, to finance and build the fastest high speed rail passenger services in the world today.

The proposed fire sale of the Northeast Corridor in 1984 was not the answer our nation was looking for. Nor were budgets zeroing out Amtrak's funding or proposing cutbacks that meant terminating service to communities on Amtrak's freight-owned routes including more than thirty cities in Illinois. Fortunately many of us in Congress have not only supported more funding to improve and expand Amtrak service, but to expand the incremental improvements in high speed rail for the Northeast Corridor and to extend these to those parts of the nation where state-of-the-art rail service is now essential.

While the previous Administration continued to downgrade rail service of any kind, many of us knew that the costs not only of losing the service, but of forgoing all the advantages of a first class system were mounting. The General Accounting Office now tells us that among the realistic, although unmeasured, benefits of high speed rail are reduced airport and highway congestion, reduction in air pollution, prevention of future energy shocks, economic development and redevelopment in cities and communities, jobs in the construction and service sectors, and advanced technology research and development by U.S. academic institutions and businesses.

The Presidents High-Speed Rail Development Act (S. 839) supports the kind of service Congressman Sangmeister and I had in mind when we introduced the HAZARD ELIMINATION IN HIGH-SPEED CORRIDOR PROGRAM in 1991, Section 1010 of the Intermodal Surface Transportation Efficiency Act (ISTEA) to eliminate the most hazardous and costly part of new high speed rail services, rail/highway level crossings. At that time we counted twenty-two high speed rail service proposals in twenty-two States which had developed their own plans in anticipation of a change in the Administration's rail policy.

Although the funding was limited to \$30 million over five years and provided for only five corridors, Section 1010 provided a significant breakthrough for the extension of the Northeast Corridor concept, bringing rail along with highways and transit into the definition of federal surface transportation, and targeting those dollars to corridors where states pledged to implement the services.

I am proud of the excellent teamwork of the State of Illinois and members of our Congressional Delegation in furthering the Chicago-St. Louis segment of our designated Midwest Corridor. In fact, Illinois, in developing the Chicago-St. Louis Corridor connected to Chicago-Detroit and Chicago-Milwaukee, will have the added advantage of a hub system which will eventually feed passenger onto the other routes.

I am submitting for the record the concept for Chicago-St. Louis service prepared by Price Waterhouse in 1992, entitled "The Chicago-St. Louis High Speed Rail Project: America is Watching," along with several factsheets prepared by the Illinois Department of Transportation for the education of Illinois public officials and citizens. A test of the X2000 tilt train on the Chicago-St. Louis corridor, which I have been promoting, is scheduled to happen in June.

Now, in addition to the funding for the five designated corridors for high speed rail and hazard elimination we will be able to fund other rail master plans for infrastructure improvements not eligible in that program. In assessing the Administration's High Speed Rail Program of 1993, it is important to look beyond the funding provisions in the bill for additional support from other programs such as ISTEA, along with contributions by States, local governments, and the private sector. This means that a \$1 billion five year program can be leveraged into financing corridors now where the future ridership potential is the greatest and where the States are committed to supporting and marketing those services.

The staged or incremental approach to reaching speeds of 150 miles per hour in qualifying corridors is the best for developing as many high speed rail services at this time as possible under the budget constraints for transportation programs. If we wait for the costlier systems such as the French TGV or the Magnetic Levitation, we will only postpone the fine service we can enjoy today or we may only have only a few miles of service.

The cost of these new incremental high speed rail systems is a fraction of the cost to add new highway lanes. \$600 billion for a 284 mile rail service between Chicago and St. Louis is a bargain next almost \$5 billion for a new highway.

An added bonus of the President's high speed rail program is the Section on Technology Development. Not only will this proposal encourage our Universities in cooperation with the private sector to provide for essential technological advances in support of high speed rail service, but this provision should also translate into new jobs for my State as well as others. I am already seeking research funds for Illinois to provide a high speed diesel or gas/turbine locomotive for those new corridors where electrification is not feasible at this time and for grade crossing protection devices that will reduce the higher costs of railroad bridges and underpasses.

This is a good bill that deserves bipartisan support. Secretary Peña should be commended for his leadership in moving high speed rail service closer to reality. You can be certain that Illinois and its Midwest neighbors in Michigan, Indiana, Missouri, Wisconsin and Ohio will advance this goal.

[“The Chicago-St. Louis High Speed Rail Project: America Is Watching,” by Price Waterhouse, October 1992, “High Speed Rail for Illinois,” by Illinois Department of Transportation, and a factsheet may be found in the committee’s files.]

PREPARED STATEMENT OF DENNIS B. NICHOLS, PRESIDENT AND CEO, TURBOMECA ENGINE CORP.

My name is Dennis B. Nichols. I am President and CEO of Turbomeca Engine Corporation (TEC) in Grand Prairie, Texas. TEC manufactures turbine engines for aircraft, marine, rail and industrial applications including power co-generation and tri-generation. Besides a variety of commercial customers, our family of turbine engines is in the service of the U.S. Air Force, the U.S. Navy, the U.S. Customs Service and Amtrak.

Turbomeca Engine Corporation of Texas is fully committed to the development of high speed rail in the United States and we support the approach taken in the Administration's High Speed Rail Bill, S. 839.

Turbomeca was the earliest entrant in the field of turbine-powered rail propulsion. The original TGV prototype in France was powered by Turbomeca engines. In 1972, high speed TGV Train 001 with two Turbo engines reached speeds of 200 mph in demonstration. The Arab oil shock that same year, caused France to commit to nuclear electrification. The result was electrified high speed train service in France and throughout Europe. However, fossil fueled Turbotrains were introduced in the United States, France, Egypt and then over the next years. The original Turbotrains have continued to run for over two decades and have over 300 million miles in world wide service, including 30 million miles in the United States.

The American financial commitment to passenger rail transportation has been extremely limited. Passenger service with speeds in excess of 100 mph emerged only in the Northeast Corridor (NEC), with electric power and the Empire Corridor between Albany and New York City with Turbomeca power. Fast trains on these corridors have been well received by the travelling public. No airline carries more people than Amtrak between Washington and New York On the Empire Corridor, with Turboliner service, ridership grew five times faster than any other place in the country outside the NEC. Unfortunately, beyond the commitment of Amtrak and New York State to these two corridors, high speed rail development in the U.S. has been confined to hundreds of thousands of pages in consultant studies, endless con-

ferences and meetings, local and state corridor planning, media events and not much else of significance.

Why has Turbomeca Engine Corporation of Texas, decided to get back into the railroad business? First, we believe America is on the brink of a breakthrough into high speed rail through the incremental corridor approach. Second, the turbine technology advance has created exciting potential. Third, turbine power is the lowest cost and lowest polluting high speed alternative available to the United States.

THE INCREMENTAL APPROACH TO HIGH SPEED RAIL

If America is to enter the world of high speed rail, it has two choices. It can make the "great leap forward" to exotic technologies of 150 mph and beyond, or it can move through the incremental approach. The approach embodied in S. 839 puts America squarely on the pathway to high speed steel-wheel passenger service over existing private railroad rights-of-way. Given the size of the Federal deficit combined with the high cost of electrification and separation of freight and passenger lines, incremental upgrade is the only practical alternative in the near term.

History of the Incremental Approach

Turbomeca's re-entry into the field of high speed rail in America is the direct result of the work by the Coalition of Northeast Governors (CONEG). In the late 1970's and early 1980's, CONEG began to address the problems of highway and air congestion in the Northeast. CONEG formed the High Speed Rail Task Force to improve intercity rail passenger service throughout the Northeast. In March of 1986, the task force launched an intensive investigation into technologies and options available for future high speed rail service. This included a program of CONEG/FRA/Amtrak equipment testing and evaluation.

In March of 1990, CONEG announced a new high speed rail policy that called for " * * * prompt action on a program of proven technologies" and made recommendations. CONEG specifically called for equipment with " * * * the capability to operate in both electrified and non-electrified rights of way [with] the ability to operate at high speeds around curves. The Amtrak/CONEG/FRA equipment tests have demonstrated the ability of existing turbo-propulsion locomotives, and tilt-technology passenger coaches to significantly improve service * * *"

In response to CONEG, and under the sponsorship of the late Congressman Silvio Conte and Senator Alfonse D'Amato, Congress appropriated \$14 million for the development of a high-speed dual-mode locomotive capable of operating through non-electrified territory. The original train sets were intended for operation between New York City and Boston. However, the NEC electrification project caused the Empire Corridor between Buffalo, Albany and New York city to be targeted as the domicile for the new technology.

Congressman Conte, expanding on the CONEG work developed a concept for a national high speed rail policy using the incremental approach. Ray Chambers, who serves as Washington Representative to TEC, outlined the key elements of the Conte Plan in the Ripon Forum Magazine May 1991. They are:

A) The goal of introducing 125-150 mph passenger service over corridors shared with freight between city pairs of less than 500 miles.

B) Development of a high speed prototype turbine locomotive to power these trains and avoid the extraordinary cost of electrification.

C) Federal designation of high speed corridors, and federal funding for grade crossing protection, track and infrastructure upgrade and technology development.

Seemingly, the legislative process leading to enactment of S. 839, is building a consensus between Congress and the Clinton Administration that will stimulate a national partnership to bring steel-wheel high speed rail to the United States in the short term.

THE FOSSIL FUEL TURBINE LOCOMOTIVE

The high speed turbine locomotive is the single key to the introduction of high speed rail outside the NEC. Amtrak is very much aware of this fact. Following the Conte/D'Amato appropriation (\$14 million), Amtrak developed specifications for the new generation fossil fuel locomotive with an enhanced "dual-mode" capability. Dual-mode gives the locomotive the ability to operate over third rail electric into New York City and onto Long Island. The existing Turboliners have a limited dual-mode capability. No proposal met the specifications and Amtrak did not award a contract. However, a great deal was learned in the process which has helped Amtrak develop a proposal for a new system of high speed rail equipment that can operate throughout the United States. The Amtrak "systems approach" is being out-

lined this morning and is supported by Turbomeca. Following are the key milestones that have moved the country toward the incremental approach:

- *The Simon Corridors.* A provision was inserted into the Intermodal Surface Transportation Efficiency Act by Senator Paul Simon of Illinois to designate 5 high speed rail corridors and provide limited funding for grade-crossing separation and protection. Congressmen George Sangmeister of Illinois and Sherwood Boehlert of New York sponsored a similar provision in the House. In the Fall of 1992, the Federal Railroad Administrator, Gil Carmichael designated 2 existing and 5 potential high speed rail corridors under the Simon Amendment.

- *The Clinton Administration Commitment.* During the Fall campaign, candidate Bill Clinton committed to high speed rail. Senate Bill S. 839 lays out a logical plan to develop corridors and provides \$1.3 billion in funding which will probably be matched by up to \$1 billion in state and local funding. There should be some modification to the legislation. We believe states like New York and California, which have already made expenditures to bring corridors up to 125 mph, should be allowed to count those in their match. Overall, we feel S. 839 is an excellent beginning and are pleased it is receiving bi-partisan support in the Congress.

- *The Freight Railroad/Amtrak High Speed Rail Agreement.* Graham Claytor, President of Amtrak, and Edwin Harper, President of the Association of American Railroads, signed an accord which, if the conditions can be met, will make it possible for high speed rail service of up to 160 mph along existing freight rights of way. Mr. Harper is testifying today on behalf of the freight railroads. The issues of liability and compensation to the road-bed owners, and the interface between freight and high speed passenger operations are serious and must be addressed by Congress. I do believe however, that ultimately, a high-speed rail network will improve the movement of time sensitive intermodal shipments and will create a lucrative new market for high-value freight that moves exclusively by air and truck today.

- *Equipment Demonstrations.* Amtrak's introduction of the 125 mph ABB/tilt train into demonstration service created an astounding amount of public and media interest. The ABB X-2000 is now on a national tour which will create excitement around the United States. The German ICE train will soon be in demonstration. However, it must be remembered that these are electric train sets can not operate outside the Northeast Corridor without fossil fuel propelled locomotives.

- *The New York Demonstration Project.* Undoubtedly, electric locomotives and tilt passenger cars will be based on off-the-shelf technology operating successfully in Europe, Canada and Japan. The great contribution in the near term will be the development of a new generation light weight turbine powered locomotive for non-electrified territory.

New York State, Amtrak and Turbomeca Engine of Texas have entered into a cooperative proposal to demonstrate in 125 mph train service on the Empire Corridor between Albany and New York City which will in fact provide a comprehensive test bed for non-electric high speed technology. It will include an advanced experimental Turboliner capable of 125 mph speeds. It will involve curve straightening, track upgrade, advanced signalling, fencing and high-speed grade crossing protection using four-quadrant gates.

New York has requested the participation of the Federal Railroad Administration and has filed an application under Section 1036(c) of ISTEA for a steel wheel 125 mph demonstration. An FRA decision is expected shortly.

At the heart of the proposal will be the assembly and integration of a state-of-the-art high speed trainset with the most modern turbine power and a new innovative interior design. For the sake of time and cost, an existing Turboliner will be the platform for the integration of systems that will produce an advanced experimental train for the future. New high tech Makila turbine propulsion will be integrated into the Turboliner. Amtrak will then test the fuel efficiency, maintenance and operating characteristics of the new turbines in high speed rail service. The futuristic interior will provide the design model for the American high speed train of tomorrow.

I am pleased to inform you that, earlier this week, Turbomeca Engine Corporation of Texas (TEC) and Morrison Knudsen (MK) of Idaho have signed an agreement to build the powercars for the 125 mph advanced turboliner. TEC and MK have the goal of an operating train set within one year of FRA project approval.

It must be emphasized that the New York Demonstration is truly a national project with North American ramifications. After six months of aggressive testing in service on the Empire Corridor, the advanced Turboliner train set will

be available for corridor demonstration service throughout the United States. We are pleased that the State of Texas has endorsed the New York proposal at the Federal Railroad Administration. It is their intent to put the prototype train into test service between San Antonio-Laredo-Monterey, Mexico. The Government of Mexico shares the Texas interest. The Canadians are also expected to pursue a turbotrain demonstration. At the end of the demonstration phase, the new Turboliner will go into regular service on the Empire Corridor.

As a result of these fast moving events, Amtrak recently announced a new program for a "systems approach" to high speed rail which will produce a new generation of high speed rail power and equipment for America. The Amtrak program is being outlined at this hearing. Their approach builds on Amtrak's previous experience and on European and Asian practice. It is cost effective, practical and can be undertaken in the near term. Senate bill S. 839 makes it possible.

THE TURBINE TECHNOLOGY ADVANCE

Why turbine? There has been a rapid advancement of turbine technology over the past two decades which makes turbine power well suited to the American market. With off-the-shelf turbine propulsion, we can today reach speeds of 125 mph and beyond on standard Class 6 freight track. The new generation turbine engine will have advantages of fuel efficiency, ease of maintenance, lower locomotive weight, and lower rights of way maintenance costs that should leave turbine power as the only near term option for propulsion in non-electrified territory.

For the New York advanced Turbotrain, Turbomeca will be using the Makila engine which is an improved new generation derivative of the existing engine in rail service. It is of a simple modular engine and has proven its reliability in demanding aircraft service. This unit runs on standard diesel #2 fuel or can be easily converted to clean burning alternative fuels such as ethanol or methanol.

With the passing of the Clean Air Act in 1990, tougher emissions standards for all modes of transportation will be required by 1995. Beginning in California that may require emissions caps for all modes of transportation including rail and aviation. Passenger rail, which has been determined to be 50 percent more fuel efficient than air travel, could compete for air passenger traffic if a clean burning locomotive is available. Turbine engines by nature are much more clean burning than diesels. Studies have shown that in a typical 250 mile corridor, turbine powered locomotives emit only 17 percent of the exhaust emissions of a standard diesel locomotive.

It should be noted, in addition, turbine trains will emit only 25 percent of the exhaust emissions of a fossil fuel power plant needed to provide the power for an electric train. Yet, in places like California, for example, there are pressures for massively expensive railway electrification in the entire Los Angeles Basin. This could bankrupt the private freight rail system that operates in the area. Burlington Northern and others are working on cleaner burning engines for freight trains. We believe turbine is the answer for passenger rail and high-value-package freight trains that can further relieve the overburdened highways and airports.

HIGH SPEED RAIL AND S. 839

If high speed rail is to be ultimately successful in this country, Congress and the Administration must play a major role. Hopefully, operations will be self-sustaining. However, there will have to be government support for equipment development, acquisition and infrastructure improvement. S. 839 is the logical first step.

PREPARED STATEMENT OF THE RAIL SUPPLY AND SERVICE COALITION

The Rail Supply and Service Coalition (RSSC) is a national coalition of the country's major railroad and transit contracting and supply companies. These companies are represented by five organizations that govern RSSC activities: National Railroad Construction & Maintenance Association; Railway Engineering—Maintenance Suppliers Association; Railway Progress Institute; Railway Supply Association; and Railway Systems Suppliers.

Together these associations represent more than 1,300 companies located in 45 states. They employ more than 150,000 individuals and account for over \$13 billion in economic activity.

The majority of RSSC companies are small and medium size businesses. RSSC was formed to give a collective voice to those businesses as government makes important decisions concerning transportation policy.

The federal government is on the threshold of making just such a decision with regard to the development of high-speed rail. While developing a successful high-speed rail system will be a lengthy process, the decisions the government makes at

the outset of that process may well determine high-speed's success or failure. We hope the Subcommittee will consider three points as it makes these important initial decisions.

First, a high-speed passenger rail system has an important role to play in our national transportation network. An increasing number of public and private studies have documented that high-speed rail offers energy savings, reduced pollution, increased safety, land conservation, reduced highway congestion and reduced highway repair expense. These are important public benefits that should not be ignored as the government makes its investment decisions.

Much has been made of the new "flexibility" in the Intermodal Surface Transportation Efficiency Act of 1991 which authorizes over \$153 billion for highway, transit and intermodal projects. While the legislation may represent a first step in the right direction, it is a very tentative step. The overwhelming majority of the funds are still devoted to highways. We concur with the recent Government Accounting Office (GAO) study High Speed Ground Transportation—Financial Barriers to Development that, "it is unlikely that any major high speed ground transportation projects will be built if developers must rely primarily on private capital." We are not suggesting increased federal spending, but more balanced federal spending.

Second, given the federal deficit situation and the limited spending currently being proposed, we believe it is wasteful to devote resources to exotic technologies such as magnetic levitation (maglev). The dollar differences are huge. According to the GAO study, the capital costs of achieving high speed operations would range from \$2.7 million per mile for incremental improvements on existing track to as high as \$60 million per mile for a maglev system. Likewise operating and maintenance costs are estimated to be 20 percent higher for a maglev system versus a conventional high speed system.

By way of perspective, we could upgrade the entire Detroit to Chicago high-speed corridor to 110 mph for what the Congress recently appropriated through the Trust Fund and General Revenues to undertake a five year maglev prototype development program.

The issue is not only one of dollars but timing. Today's freight rail network is in place. Speeds already approach 80 mph on some segments. The Association of American Railroads has approved a policy statement indicating the freight railroads' willingness to cooperate in the extension and advance of high-speed service over their rights-of-way. Incremental improvements to the roadbed, signal systems and grade crossings can be quickly achieved and bring immediate increases in speed. The successful development of a maglev system would require substantial research and development, lengthy delays to identify, purchase and permit new rights-of-way and a significant construction period.

It is argued by some that maglev investment could generate new jobs in a new high-tech industry. While that may be, the alternative "incremental" approach supported by RSSC is no less important a source of jobs, and that fact should not be overlooked by the government. The companies represented by our organization will supply the majority of materials and labor needed to build a high-speed rail system over the existing rail network. While these jobs may not have the glamorous appeal associated with a new, exotic technology, they are jobs nonetheless. Moreover, these are jobs that can be created quickly as there is a very short startup time required for these "incremental" improvements.

Third, if high-speed rail funding is to remain as limited as it is today, we should concentrate that spending on a limited number of projects. Each successful high-speed corridor will demonstrate the advantages of high-speed rail and generate increasing public support for expanding on that success. Yet, even the so-called "incremental" approach is an expensive proposition. If existing limited resources become a pot out of which every congressional district dips for its "fair share", then the effectiveness of these resources will be greatly diminished and individual project successes will come slowly if at all. We encourage the Congress to target available resources to a limited number of projects that meet objective criteria for success.

It will come as no surprise to the Congress that RSSC members have a strong self-interest in the development of high-speed rail. Our companies will benefit from increased investment in the nation's railroad infrastructure.

However, as individuals who have devoted their professional careers to building and supplying the railroad industry, we believe we also bring experience and a unique perspective to this issue. Collectively our companies are responsible for the industry's construction, manufacturing, research, testing and product application. We are the source of significant research funding for new and innovative rail technology. We develop the services and equipment to make rail operations safer, more productive and more profitable.

In short, we understand the industry, how it grows, what works and what doesn't work. We believe the potential exists to build a successful and safe high-speed rail system and we believe our companies can make an important contribution to both the planning and implementation of that effort.

We appreciate the opportunity to share our views with the Subcommittee and would welcome the opportunity to provide further information.

**PREPARED STATEMENT OF ROSS CAPON, EXECUTIVE DIRECTOR, NATIONAL
ASSOCIATION OF RAILROAD PASSENGERS**

The National Association of Railroad Passengers is grateful for the important leadership this committee has provided towards development and improvement of intercity rail passenger service in the U.S.

We are excited that the new administration recognizes the nationwide implications of the Amtrak/federal government New York-Washington experience: that there is an important role for fast corridor passenger trains elsewhere.

I. INTERCITY RAIL PASSENGER NEEDS IN THE IDEAL WORLD

Federal transportation policy should put intercity passenger rail investments on a level playing field with aviation and highways in terms of the ability of state and local funds to attract federal dollars. In that regard, we were disappointed that:

- Senate-approved language making passenger rail an eligible use of ISTEA Surface Transportation Program funds was not adopted; and
- the administration quickly moved to put the 2.5 cents now going to deficit reduction into the Highway Trust Fund without regard for proposals to earmark one penny for creation of an intercity rail passenger capital improvement trust fund.

II. S. 839 IS WELCOME REAL-WORLD PROGRESS

At least for approved corridors, S. 839 would nudge federal policy in the right direction. We recognize that full funding of S. 839 poses a challenge, given the present budget environment, but we urge Congress to fully fund both S. 839 and the Amtrak authorization.

The biggest shortcoming of U.S. rail passenger transportation is its failure to utilize available technology adequately. Also, the most frustrating aspect of "high speed" discussions is their preoccupation with projects so costly that they are unlikely to be created, except as the end-result of the same incremental process that many have criticized.

Consequently, we are glad S. 839 seems primarily aimed at improving utilization of existing rail lines. Making best use of existing resources is good for the environment and means tangible service improvements should be realized within the next four to five years. That is good policy, good economics * * * and good politics.

Some criticisms of "incrementalism" warn, for example, that Amtrak's Chicago-Detroit trains are slower today than 50 years ago. While the fastest trains of today are 4.8 percent slower than the fastest trains of 1949, today's speeds are up from what Amtrak inherited. Also, the failure of investment to date to beat 1940s speeds simply means that—as in the Northeast Corridor—there was much deferred maintenance to overcome.

Chicago-Detroit Endpoint Average Speeds

	in miles per hour	
	Fastest schedules	All schedules
"Stage-One" Plans ¹	70.9	70.9
1993 Amtrak	54.0	52.3
1970 New York Central	48.5	45.6
1949 New York Central ²	56.7	43.9

¹ Michigan DOT estimates \$111 million in infrastructure investment would increase ridership 450 percent, from today's 400,000 a year to 22 million.

² A 1943 timetable is not at hand, but railroads invested heavily in new rolling stock right after the war and peacetime schedules probably provide a fairer baseline. Between 1943 and 1949, incidentally, the ICC imposed an arbitrary 79-mph speed limit on trains "without supplementary signal systems."

Of course "Stage-One" improvements are only a start, but they will help create a climate that enables further stages to follow.

III. HIGH-TECH GRADE CROSSING DEVICES

Creation of high speed corridors inevitably means eliminating some rail/highway grade crossings. However, the U.S. has a huge number of crossings (about 70 just in the 64-mile Miami-West Palm Beach segment). Many crossings cannot be closed. Grade separation projects are costly. Therefore, the U.S. should study Sweden's practice of allowing 125-130 mph train speeds at crossings protected by full-road-width gates and by electronic highway vehicle detection systems which automatically halt the high-speed X2000 if a vehicle is trapped between the gates. We understand about 100 crossings were equipped with such devices in 1990-91 for about \$800,000 per crossing and there have been no accidents.

IV. SECTION 402 APPLIES

We are alarmed at suggestions that Section 402 of the Rail Passenger Service Act should not apply to services benefiting from S. 839. There is no reason why existing—or prospective—Amtrak routes should lose the protection of Section 402 as the result of the modest improvements contemplated under S. 839. Also, with expiration in 1996 of the basic agreement between Amtrak and the freight railroads, we are concerned that the railroads may be testing the water for a broader repeal of Section 402 next year, something on which they should be given no encouragement.

V. HIGH SPEED RAIL DEFINED

The public thinks high speed rail means service that is air-competitive, i.e., able to attract a significant number of riders from airplanes, with resulting benefits in terms of environmental impact, overall U. S. energy efficiency, and reduced congestion in the aviation—and, to a lesser extent, highway—systems.

This definition is market-driven, not technology-driven. Travelers on trains as on planes care primarily about total travel times, not top speed. Amtrak's Metroliners have big market impact with 125 mph top speeds. In some corridors where the gap between top and average speed is fairly narrow, trains with a lower top speed could be air-competitive.

Japan's bullet trains captured the world's imagination with a top speed of 130 mph when service began in 1964. (Bullet trains did not exceed 142 mph until 1992, and 142 remains the limit for many such trains.) The Metroliners and the bullet trains both are air-competitive and most people consider them "high speed," although Amtrak's equipment compares unfavorably to the X2000 in terms of noise and general ambiance.

Even the Paris-Lyons TGV uses conventional tracks at unspectacular speeds much of the time, so passengers can travel to distant points without changing vehicles—contrary to the original plan under which "TGV was meant to somewhat resemble airline service and compete with it directly, especially since the Paris-Lyons service is a high-speed shunt similar to what the airline provides. It was soon realized that it is better to offer a superior rail product, whose 'network effect' and quality of service are as important as travel time. * * * Since the high-speed trunk is so costly, it must in fact be fed by the network for the whole system to be profitable" (The TGV System: A Technical, Commercial, Financial, and Socio-Economic Renaissance of the Rail Mode, by Daniel L. Roth, 1990).

The TGV situation dramatically illustrates the importance of compatibility of high speed trains with existing infrastructure.

VI. AMTRAK'S HEALTH IS CRUCIAL TO HIGH SPEED PROGRESS

An "incrementalist" focus makes obvious the close relationship between success of the high speed initiative and Amtrak's financial health—which directly impacts Amtrak's ability to provide reliable service. The proposed high speed rail initiative will look strange indeed if Amtrak service deteriorates and rail market-share trends turn negative in the very corridors the new program seeks to develop. Even the health of the long-distance network is important in this regard, since so many passengers transfer between long-distance and corridor trains.

In conclusion, we support S. 839 and appreciate the opportunity to submit these comments.

PREPARED STATEMENT OF STEVE HETTINGER, MAYOR, HUNTSVILLE, AL

Mr. Chairman and distinguished members of the Subcommittee on Surface Transportation, this testimony is submitted for and on behalf of the Memphis-Huntsville-Atlanta Corridor Coalition (Coalition) of Mayors, elected officials, regional planning

and development agencies, metropolitan planning organizations and economic development agencies along this 4 State transportation corridor.

We respectfully request the Memphis-Huntsville-Atlanta Corridor (M-H-A Corridor) be designated a high-speed rail corridor (HSR Corridor) as the M-H-A Corridor highway is under corridor study for a controlled access freeway, the scope of work to include consideration for high-speed rail and other modes of transportation. In support thereof we submit for your consideration the following:

- The Memphis-Huntsville-Atlanta Corridor serves two major metropolitan areas: Atlanta (MSA 12) and Memphis (MSA 41); and three MSA's in between: Huntsville (MSA 117); Decatur (MSA 202); and Florence (MSA 204) (Exhibit "A").

- Congress, in the Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA), declared the Memphis-Huntsville-Atlanta Corridor a High Priority Corridor of National Significance, placed it on the National Highway System (NHS), and appropriated \$25.4 million to jump start planning.

- The Alabama Highway Department has been designated by the other States, Georgia, Mississippi and Tennessee, as the lead agency and has issued a Request for Proposals (RFP) (Exhibit "B") to accomplish studies to secure corridor approval for a controlled access freeway for the Alabama portion of the Memphis-Huntsville-Atlanta Corridor, the scope of work including consideration for high-speed rail, intelligent vehicles, and other modes of transportation in accordance with the Federal Highway Administration's (FHWA) intermodal planning process guidelines.

- Congress, in the ISTEA, found that "the development of transportation corridors is the most efficient and effective way of integrating regions and improving efficiency and safety of commerce and travel and further promoting economic development."

- The Memphis-Huntsville-Atlanta Corridor serves over 100 Fortune 500 Companies (Exhibit "C").

- The Memphis-Huntsville-Atlanta Corridor encompasses the following major Defense and Government installations: Army Missile Command; NASA's Marshall Space Flight Center; NASA's Advanced Solid Rocket Motor facility; and other government facilities (Exhibit "D").

- The Memphis-Huntsville-Atlanta Corridor represents the first worldwide opportunity to plan, design and construct a transportation corridor highway based on the intermodal planning process, accommodating high-speed ground transportation, intelligent vehicles, and other transportation modes, thereby demonstrating: Land Use Conservation; High-Speed standards and guidelines; Energy and power alternatives; Utilization of Defense and Space technologies; and Transportation corridor integration.

- The Memphis-Huntsville-Atlanta High Priority Corridor of National Significance represents the most economical and expeditious way to advance high-speed rail transportation. Constructing the Corridor highway to accommodate high-speed rail saves 65 percent of the cost of the high-speed system without appreciably increasing the cost of constructing the highway.

- oThe Corridor project is supported by a Coalition of State and local governments and agencies thereof (Exhibit "E").

Mr. Chairman, inasmuch as engineering and environmental studies have been authorized to secure corridor approval for a controlled access freeway that will include consideration for high-speed rail, intelligent vehicles and other modes of transportation, providing the first major segment of high-speed ground transportation in the United States, we respectfully request the Memphis-Huntsville-Atlanta High Priority Corridor also be designated a high-speed rail corridor.

EXHIBIT NO. "A"

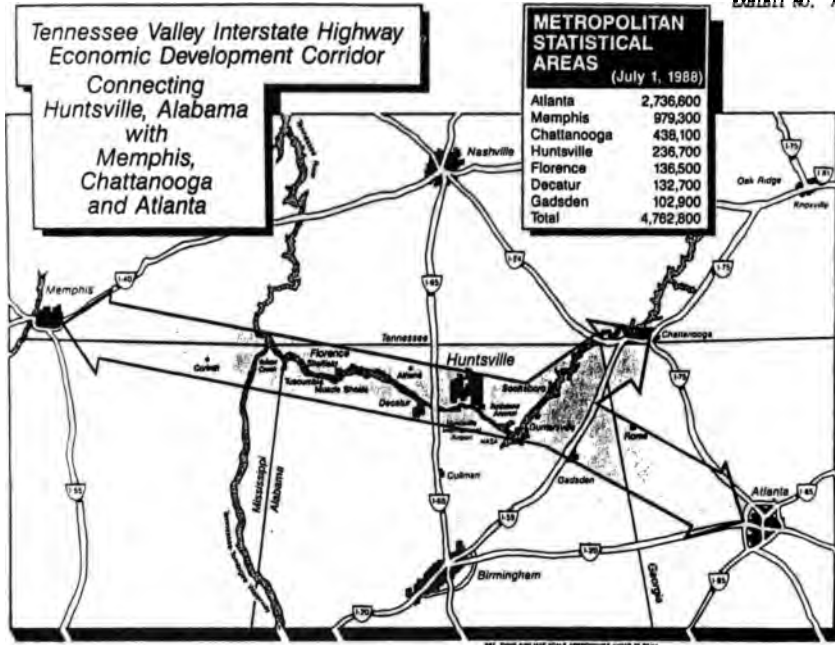


EXHIBIT B

NOTICE OF NEED
FOR SERVICES

Notice is hereby given that the Alabama Highway Department, 1409 Coliseum Boulevard, Montgomery, Alabama 36130, is requesting submittal of interest from all engineering firms interested in performing work outlined in the following scope of work.

ARTICLE I -
SCOPE OF WORK

The CONSULTANT will perform engineering and environmental studies, prepare required environmental documents, secure corridor approval for a controlled access freeway for the State of Alabama portion of the east-west corridor from Memphis, Tennessee through Huntsville, Alabama to Atlanta, Georgia, a distance of approximately 166 miles from the state line to the state line. The CONSULTANT must demonstrate in-house capability or assemble a project team which can accomplish the work as outlined within a two (2) year period from the date of the Notice to Proceed.

To receive a detailed Scope of Work, please contact Ms. Wendy Kelly at (205) 242-6318.

TO EXPRESS INTEREST

Two copies of your statement of interest are to be identified with project number DP5-A002(001) and are to be submitted prior to close of business, 5:00 p.m. CST on April 5, 1993 to the Chief Engineer, State of Alabama Highway Department, 1409 Coliseum Boulevard, Montgomery, Alabama 36130.

March 19, 1993



EXHIBIT E

State of Alabama; State of Mississippi; State of Tennessee; North Alabama Mayors Association; City of Athens, Alabama; City of Atlanta, Georgia; City of Centre, Alabama; City of Corinth, Mississippi; City of Florence, Alabama; Town of Grant, Alabama; City of Huntsville, Alabama; City of Iuka, Mississippi; City of Memphis, Tennessee; City of Rainesville, Alabama; City of Rome, Georgia; City of Russellville, Alabama; City of Scottsboro, Alabama; City of Section, Alabama; City of Stevenson, Alabama; Town of Double Springs, Alabama; Town of Waterloo, Alabama; Town of Woodville, Alabama; Cherokee County, Alabama; Jackson County, Alabama; Floyd County, Georgia; Morgan County, Alabama; Department of Planning & Development, Atlanta, Georgia; Floyd County, GA Metropolitan Planning Organization; Top of Alabama Regional Council of Governments; Northeast Mississippi Planning & Development District; North Central Alabama Council of Governments (Decatur MPO); Northwest Alabama Council of Local Governments (Shoals MPO); Huntsville Metropolitan Planning organization; Cherokee County Chamber of Commerce; Corinth-Alcorn County Chamber of Commerce; Greater Rome Chamber of Commerce; Jackson County Economic Development Authority; Tennessee-Tombigbee Waterway Development Authority; and Tennessee Valley Authority.

BACKGROUND PAPER ON ELIMINATING OR LIMITING PUNITIVE DAMAGES FOR RAILROAD PASSENGER DEATHS AND INJURIES

The potential for punitive damages arising out of railroad passenger accidents has been a vexing problem for Amtrak ever since Amtrak's creation. Outside the Northeast Corridor, which Amtrak owns, Amtrak's ability to operate intercity passenger trains requires use of track owned by the freight railroads. Almost from the outset, the freight railroads have refused to agree to Amtrak's use of their tracks unless Amtrak agreed to bear the liability arising from the deaths of or injuries to passengers. As a practical matter, Amtrak has had no choice but to agree.

The scope of Amtrak's exposure to punitive damages was litigated in connection with the January 4, 1987, Chase, Maryland crash. A Conrail crew, smoking marijuana while driving an engine with intentionally disabled safety devices, ignored multiple speed limitations and stop signals and pulled directly into the path of an on-coming high-speed (approximately 120 m.p.h.) Amtrak passenger train. The collision killed the Amtrak engineer and 15 passengers and injured 174 others. Despite the criminal misconduct of its crew, Conrail, invoking its agreement with Amtrak, sought to have Amtrak indemnify Conrail for all liability (including punitive damages) for the deaths and injuries.¹ Amtrak went to court seeking a declaration that it did not have to indemnify Conrail. The case was ultimately settled.

The liability apportionment provisions between Conrail and Amtrak still exist, and substantially identical provisions are in effect between Amtrak and the other freight railroads. The freight railroads say they will not let Amtrak make improvements to or use their tracks for high-speed operations unless Amtrak unequivocally confirms that it will indemnify them against any and all liability for passenger deaths and injuries—punitive damages included—no matter how egregiously the freight railroads may be at fault.

The specter of punitive damages casts a shadow over Amtrak's passenger rail operations generally, and over its expansion of high-speed operations in particular. Punitive damages awards have grown dramatically during the last two decades, both in the number of awards and the amounts awarded. A 1992 study reported that business-related punitive damages awards in five large states (California, Illinois, New York, Florida and Texas) were 89 times greater in the period 1988-1991 than during 1968-1971, adjusted for inflation, and that in these five states alone businesses paid more than \$343 million in punitive damages during 1988-1991.² Entire industries, such as general aviation manufacturing, pharmaceuticals, vaccines, and medical supply production and marketing, have been severely impacted by past punitive damages awards and the possibility of future awards.³

¹ Conrail's total liability was \$94.5 million. Conrail also sought indemnification for its attorneys' fees, which exceeded \$3 million.

² Stephen M. Turner, et al., *Punitive Damages Explosion: Fact or Fiction?* (Washington Legal Foundation, Working Paper Series No. 50, Nov. 1992).

³ See Richard J. Mahoney, et al., *Innovation on Trial: Punitive Damages Versus New Products*, Science, Vol. 246, pp. 1395-99 (Dec. 15, 1989) (describing instances in which positive technologies have been withheld from development or marketing because of the costs of actual or potential punitive damages awards).

Likewise, the long-term financial viability of Amtrak's high-quality passenger rail service—and particularly high-speed service—will be jeopardized without meaningful protection from punitive damages awards on account of passenger deaths and injuries. To be meaningful, protection from exposure to such punitive damages must of course extend to liability imposed on the freight railroads that Amtrak must indemnify in exchange for access to their tracks. In his testimony on April 29, 1993, W. Graham Claytor, Jr., Amtrak's President and Chairman, expressed Amtrak's desire to work with the Congress in attempting to develop creative solutions to this difficult problem.⁴ The following material discusses some of the many precedents.

OTHER SITUATIONS WHERE CONGRESS, THE COURTS AND THE STATES HAVE LIMITED OR PRECLUDED PUNITIVE DAMAGES

The Federal Government, State governments, and the courts have limited or precluded punitive damages in a wide variety of areas, including passenger rail service:

- The National Childhood Vaccine Injury Act of 1986 contains two prohibitions against punitive damages. First, the Act precludes the recovery of punitive and exemplary damages under the National Vaccine Program, which provides compensation for injuries and deaths resulting from inoculation with childhood vaccines. 42 U.S.C. § 300aa-15(d)(1) (West Supp. 1993). Second, the Act generally precludes the recovery of punitive damages in civil actions against vaccine manufacturers who have complied with applicable FDA requirements. *Id.* § 300aa-23(d)(2).⁵

- The 1988 amendments to the Price-Anderson Act prohibit the award of punitive damages in any action with respect to a nuclear incident or precautionary evacuation against any operator of nuclear power reactors with whom the Federal Government has entered into an indemnity agreement. 42 U.S.C. § 2210(s) (West Supp. 1993). By this prohibition, Congress sought to ensure that Federal taxpayers would not have to pay for punitive damage awards. S. Rep. No. 70, 100th Cong., 2d Sess. 27 (1987), reprinted in 1988 U.S.C.A.N. 1424, 1440.

- The Warsaw Convention,⁶ as amended by the Montreal Agreement,⁷ limits the liability of an air carrier to \$75,000 in damages for the death or injury of each passenger in an incident occurring in the course of international air travel. Although Article 25 of the Convention states that a finding of "willful misconduct" against the air carrier avoids the liability limitation, the United States courts have interpreted the Convention to preclude the award of punitive damages.⁸

- The Federal Tort Claims Act expressly exempts the United States from liability for punitive damages. 28 U.S.C.A. § 2674 (West 1965 & Supp. 1993). United States Courts of Appeals have interpreted the Act to preclude the award of any damages, no matter how denominated, that do not compensate for actual loss, regardless of whether such damages are permitted under applicable state tort law.⁹

- The New York Court of Appeals has held that the Long Island Rail Road is immune from punitive damages, even though it is not a political subdivision, because of "the essential public function served by [it] in providing commuter trans-

⁴Testimony of W. Graham Claytor, Jr., before the Subcommittee on Transportation and Hazardous Materials of the House Committee on Energy and Commerce, April 29, 1993.

⁵There are three narrow exceptions. The Act allows recovery of punitive damages where the manufacturer has engaged in (a) fraud or intentional and wrongful withholding of information from the FDA in the approval process, (b) intentional and wrongful withholding of information concerning safety or efficacy after approval, or (c) criminal or illegal activity relating to vaccine safety and effectiveness. 42 U.S.C. § 300aa-23(d)(2) (West Supp. 1993).

⁶Convention for the Unification of Certain Rules Relating to International Transportation by Air, Oct. 12, 1929 49 Stat. 3000, reprinted in 49 U.S.C.A. app. § 1502 (West (adherence of United States proclaimed, Oct. 29, 1934)).

⁷Agreement Relating to Liability Limitations of the Warsaw Convention and the Hague Protocol, Civil Aeronautics Board Agreement No. 18900, approved by Executive Order No. 23680 (May 13, 1966), 31 Fed. Reg. 7302 (May 19, 1966). See 14 C.F.R. Part 203.

⁸See *In re Air Disaster at Lockerbie, Scotland* on December 21, 1988, 928 F.2d 1267, 1285 (2d Cir.), cert. denied 112 S. Ct. 331 (1991). The court reasoned that allowing punitive damages would be inconsistent with most of the original objectives of the Convention, including: limiting liability to foster the growth of the airline industry, ensuring that air carriers can effectively insure against loss, and compensating injured passengers with a minimum of litigation. *Id.* at 1287-88. The Eleventh and D.C. Circuits have also held that punitive damages are not permitted in claims governed by the Warsaw Convention. *Floyd v. Eastern Airlines, Inc.*, 872 F.2d 1462, 1484 (11th Cir. 1989), rev'd on other grounds, 111 S. Ct. 1489 (1991); *In re Korean Air Lines Disaster of Sept. 1, 1983*, 932 F.2d 1475, 1479 (D.C. Cir.), cert. denied 112 S.Ct. 616 (1991).

⁹See *Flannery v. United States*, 718 F.2d 108 (4th Cir. 1983), cert. denied, 467 U.S. 1226 (1984); *Felder v. United States*, 543 F.2d 657 (9th Cir. 1976); *D'Ambra v. United States*, 481 F.2d 14 (1st Cir.), cert. denied, 414 U.S. 1075 (1973); cf. *Kalavity v. United States*, 584 F.2d 809 (6th Cir. 1978) (allowing, as non-punitive, damages on account of non-monetary losses that are customarily awarded under traditional tort principles of compensation and deterrence).

portation and the public source of much of its funding." *Clark Fitzpatrick v. Long Island R.R. Co.*, 70 N.Y.2d 382, 387, 521 N.Y.S.2d 653, 655 (1987).

- The Georgia Supreme Court has held, on the basis of public policy considerations, that the Metropolitan Atlanta Rapid Transit Authority is immune from punitive damages awards arising out of its rail operations. *Metropolitan Atlanta Rapid Transit Authority v. Boswell*, 261 Ga. 427 (1991).

- The New Jersey Tort Claims Act exempts New Jersey Transit Rail Operations, Inc. from the imposition of punitive damages. N.J.S.A. 59:9-2(c).

- The Texas High Speed Rail Act, which created a state agency specifically charged with developing high speed rail, immunized the agency from liability for punitive damages. Tex. Rev. Civ. Stat. Ann. art. 6674v.2 (Vernon Supp. 1993).

- The Northeast Illinois Regional Commuter Railroad Corporation and Chicago Transit Authorities are immune from liability for punitive damages under the Local Governmental and Governmental Employees Tort Immunity Act (Ill. Rev. Stat. 1989, ch.85, pars. 2-101, 1-206). See *Smith v. Northeast Illinois Regional Commuter Railroad Corp.*, 210 Ill.App.3d 223 (1st Dist. 1991) and *Bilyk v. Chicago Transit Authority*, 125 Ill.2d 230 (1988).

- The Pennsylvania Supreme Court has held that SEPTA is immune from liability for punitive damages. *Feingold v. Southeastern Pennsylvania Transportation Authority*, 512 Pa. 567, 517 A.2d 1270 (1986).

- Finally, some states have prohibited punitive damages outright,¹⁰ and others have capped them at various levels.¹¹

Exemptions from punitive damages generally rest on two rationales: First, punitive damages may discourage activities that, while involving some inherent risk, yield substantial social benefits. In such cases, removing the threat of punitive damages furthers the public interest while at the same time allowing injured persons to be compensated. Second, it is neither fair nor sound policy to require the public at large to bear the financial burden of punitive damages. This recognition underlies the Supreme Court's holding that punitive damages may not be imposed against municipalities unless expressly authorized by statute, since "such awards would burden the very taxpayers and citizens for whose benefit the wrongdoer was to be chastised." *City of Newport v. Fact Concerts, Inc.*, 453 U.S. 247, 260 (1981).

Both rationales support protecting Amtrak against exposure to punitive damages arising from the death of or injury to Amtrak passengers, particularly in light of the expansion of Amtrak's high-speed passenger rail operations. First, strong national interests—including enhancement of competition in the transportation industry, reduction of air pollution, and decreased reliance on gasoline—favor the long-term existence of an efficient and financially viable rail passenger network. Amtrak's ability to achieve those goals could be jeopardized by large punitive damage awards. Second, like municipalities, Amtrak relies upon governmental payments (which come, ultimately, from the taxpayers) to supplement its operating revenues (which themselves come largely from Amtrak's general ridership). Thus, imposition of punitive damages would fall ultimately upon either the taxpayers (through the need for additional tax revenues) or the riding public (through the need to increase rates).

Protecting Amtrak, its general ridership and the taxpayers against the costs of punitive damages is essential to Amtrak's long-term financial security and stability. As this memorandum shows, that goal is well within the mainstream of legislative and judicial precedents.

QUESTIONS ASKED BY SENATOR HOLLINGS AND ANSWERS THERETO BY MR. CLAYTOR

Question 1. Mr. Vranich testified that the corridor master plans should require a two-part, long-term plan for eventual true high-speed service, even if incremental improvements are only the first phase. How do you view the need for such a long-term planning requirement?

Answer. Amtrak agrees with the two-tiered approach to high-speed rail advocated by Mr. Vranich. As the Committee is aware, we strongly believe that, in initially bringing high-speed rail to the United States, an incremental approach must be taken which upgrades existing facilities for higher speeds. We also believe, however, that the success of such upgraded service may well provide a ridership foundation which would justify the considerably higher costs of ultra high-speed rail. In cases

¹⁰ Louisiana, Massachusetts, Nebraska, New Hampshire, Washington.

¹¹ Alabama, Colorado, Connecticut, Florida, Kansas, Nevada, North Dakota, Oklahoma, Texas, Virginia.

such as this, corridor master plans that have been developed for both options in tandem will ensure a resource-effective transition to higher speed service.

Question 2. You testified that development of high-speed, non-electrified locomotives would be a priority for Amtrak, but that you were not satisfied with the responses to a previous procurement. Why?

Answer. The unsuccessful procurement was for non-electric, dual-mode locomotives capable of reaching an operating speed of 125 miles per hour. The possibility of acquiring such a locomotive was optimistic when we challenged the railway supply industry to design and quote such a locomotive. Because we did not receive a compliant and commercially acceptable proposal within our repeated attempts to solicit, we determined that it was more appropriate to incorporate the non-electric, dual-powered locomotive program within our plans to acquire high-speed trainsets to accommodate the Northeast corridor. The proposals were non-compliant for various reasons. They either did not meet our weight requirements or our requirements for acceleration and maximum operating speed. In addition, the proposals all exceeded the available funds appropriated for this effort.

By proceeding with the non-electric locomotive development as part of the Northeast Corridor trainset acquisition, Amtrak will enable the vendors to utilize much of the developmental cost of the trainset support systems and propulsion equipment of the electric locomotives in the non electric locomotives. From our work with General Electric on the AMD-103 diesel program, we have been able to develop a 4000 horsepower locomotive that efficiently operates at 103 miles per hour and can be further enhanced with three phase AC traction drive to 110 to 115 miles per hour.

Informal discussions with many railway equipment vendors confirm our concept to be a logical and technologically sound course of action that could produce a high-speed locomotive by late 1995. Public notice to pre-qualify vendors for this program was published on May 7, 1993, and initial responses were received on June 21, 1993. Amtrak is currently reviewing these responses to ensure that all participants in this important program have the technical expertise, financial strength, and adequate resources—including domestic manufacturing and assembly facilities—to successfully accomplish the program.

QUESTIONS ASKED BY SENATOR EXON AND ANSWERS THERETO BY MR. CLAYTOR

Question 1. The Committee heard testimony that the role of operator of these projects should specifically be opened to competition, whether it be Amtrak or another entity such as an airline. What is your view on this issue, and should the bill be amended to reflect this?

Answer. Amtrak firmly believes in competition and is prepared to compete for the right to operate high-speed rail systems if necessary. Amtrak is in a strong position to contribute to the development and operation of high-speed rail as the sole operator of high-speed rail service in the country. Given the limited federal and state resources available for the development of high-speed rail, it is important to note that Amtrak could provide a more cost efficient operation under the Rail Passenger Service Act than any other potential operator. In addition, we are currently developing an existing conventional-speed passenger and freight line into a high-speed rail corridor in the Northeast Corridor. Amtrak currently provides conventional service on at least part of each potential high-speed corridor.

In addition, Amtrak is concerned about having non-rail entities compete to provide high-speed rail service if those entities are not required to comply with the provisions of federal labor law that govern the safe operation of railroads. Competition is fine as long as safety and cost efficiency are considered before inviting all interested parties to compete to provide high-speed rail service.

Question 2. Mr. Buchanan testified that rail labor supports extending our existing rail labor and safety laws to high-speed rail projects under the program. What is your position on this issue?

Answer. As indicated in a previous answer Amtrak believes that it is important that any entity bidding on the right to operate high-speed rail service be subject to the existing federal rail labor and safety laws. In this way an equal bidding basis is established and the safety of high-speed rail operations is insured.

QUESTIONS ASKED BY SENATOR DANFORTH AND ANSWERS THERETO BY MR. CLAYTOR

Question 1. What gap would high-speed passenger rail service fill within the existing transportation system? Could the same need be filled in other ways? At the least cost?

Answer. Amtrak envisions high-speed rail systems primarily being used for shorter distance trips, in which point-to-point running times would not exceed three to five hours. While this market is now served by the airlines with their hub-and-spoke systems, airlines more effectively serve longer-distance trips. For shorter distance trips, this hub-and-spoke system often diverts passengers several hundred miles out of their way, and adds unnecessary travel time to what would otherwise be a short direct flight. High-speed rail would carry passengers directly between their desired points of travel with air-competitive trip times, reducing the need for short flights and freeing up airway, runway and gate space at congested airports such as Boston's Logan or Chicago's O'Hare. This would then permit airlines to focus their increasingly constrained resources on the longer distance trips that they are more efficient at operating and avoid the need to build additional airports in already congested urban areas.

Given that air travel's primary selling point is trip time, Amtrak believes no other form of transportation would fill this niche' more cost effectively than high-speed rail. Any other less cost-intensive transportation forms, such as conventional speed rail, will not meet the public's trip time requirements.

Question 2. Does an incremental increase in train speeds up to 150 miles per hour make enough difference in travel time to justify spending \$1.3 billion?

Answer. The Coalition of Northeast Governors (CONEG) has identified the following benefits from an investment in high-speed rail between Boston and New York:

- Diversion of up to 3 million passengers from air and highway travel, significantly reducing congestion of the area's airports and highways. This diversion may obviate the need for a second airport in Boston.
- Potential savings of over 24 million gallons of gasoline and jet fuel annually.
- Regional economic gains resulting from reduced and more reliable travel times for commuters and intercity travelers.
- Additional employment generated by construction work and continuing operations.

Additionally, Amtrak estimates a revenue increase of \$145.4 million annually by the year 2010. based on these benefits, Amtrak believes the \$1.3 billion investment in high-speed rail between New York and Boston is justified.

QUESTIONS ASKED BY SENATOR HOLLINGS AND ANSWERS THERETO BY MR. HARPER

ADEQUACY OF ADMINISTRATION'S PROPOSAL

Question 1. Do you believe the Administration's high-speed rail proposal offers sufficient funding, structured in an appropriate manner, to lead to corridor construction or high-speed improvements?

Answer. AAR has not conducted any independent studies of the funding requirements for future corridors on a national basis. However, it is clear that high-speed rail construction or improvements will be very expensive. For example, AAR's Research and Test Department analyzed on an a priori basis, a hypothetical up-grade of a 300-mile corridor now operating under FRA Class 4 track standards (60 m.p.h.) to permit 90 m.p.h. passenger service. Preliminary cost estimates were \$14,000,000 in start-up costs and \$850,000 annually in Increased maintenance costs. This estimate was for rather minimal upgrades and probably represents the very low end of what would be required to upgrade a corridor for highspeed service. Unfortunately, since cost estimates vary greatly with route and service characteristics, average costs are of little utility.

LIABILITY

Question 2. You testified that liability issues must be resolved before the freight railroads will participate in high-speed rail. why should this issue not be left to the states to resolve?

Answer. Unfortunately, state resolutions do not guarantee totally practical results. For example, a corridor state may limit recovery, or may permit indemnification regardless of degree of culpability. Such initiatives would bind litigants bringing suit in that state. However, a suit could be brought in another jurisdiction where the underlier railroad or the passenger operator (such as Amtrak) is subject to service of process. That forum might, as a matter of its own view of public policy, refuse to honor the limits or restrictions placed by the corridor state. The railroads cannot gamble on such results and federal intervention will be necessary.

QUESTIONS ASKED BY SENATOR EXON AND ANSWERS THERETO BY MR. HARPER

AMTRAK'S ROLE

Question 1. The Committee heard testimony that the role of operator of these projects should specifically be opened to competition, whether it be Amtrak or another entity such as an airline. what is your view on this issue, and should the bill be amended to reflect this?

Answer. AAR understands that the bill as drafted permits competition among entities seeking to become contract operators. AAR has not taken a position on this issue.

RAIL LABOR

Question 2. Mr. Buchanan testified that rail labor supports extending our existing rail labor and safety laws to high-speed rail projects under this program. what is your position on this issue?

Answer. AAR's member roads are all subject to the Railway Labor Act and to the federal safety requirements enforced by the Federal Railroad Administration. They envisage no change to the extent their facilities or employees become deployed in aid of high-speed passenger service.

QUESTIONS ASKED BY SENATOR DANFORTH AND ANSWERS THERETO BY MR. HARPER

Question 1. Are freight railroads prepared to negotiate track rights and liability with passenger providers other than Amtrak?

Answer. Yes.

Question 2. Are the freight railroads likely to return to the passenger service business themselves?

Answer. Some freight railroads have contracted to perform passenger service for certain commuter authorities. The freight railroads are not likely to return to the intercity passenger service business, either for conventional or high-speed service, for their own account.

Question 3. What potential benefits might freight railroads realize from the improvement or elimination of grade crossings that might occur as part of high-speed rail corridor development? Would there be other benefits?

Answer. Under federal regulations governing grade crossings, railroads are not deemed to benefit from grade crossing improvements. 23 CFR 646.210(b)(1). DOT deems that railroads benefit only to the extent of 5 percent of the cost of certain grade crossing eliminations. 23 CFR 646.210(b)(3). The public at large is the beneficiary of these programs.

Other benefits are even more difficult to discern. This is partly because each corridor is different. For example, on corridors where existing freight service has high density, the accommodation of additional passenger operations can be a substantial detriment. Essentially, the nation's freight network is well attuned to serving its existing traffic needs and no substantial level of benefits would be conferred, but costs could increase significantly.

Question 4. Are there added potential costs to freight railroads that would result from high-speed rail corridor development?

Answer. As noted in the previous answer, passenger service requires an accommodation by existing freight operations. The higher speed the passenger service attains, the greater the accommodation and the higher the operating and maintenance costs. In addition, with greater speeds, there will be the need to install and maintain signal/control systems and, in some cases, cab signals on roads that do not presently need them. Freight railroads could also face reduced asset productivity. Their customers may experience service degradation as a result of having to accommodate high-speed passenger service. These factors also would impose a cost on freight railroads. These costs would vary with each corridor and with the level of speed desired. The freight railroads will insist on compensation for these costs.

QUESTIONS ASKED BY SENATOR HOLLINGS AND ANSWERS THERETO BY MR. SALCI

AMERICAN LEADERSHIP

Question 1. As you probably know, the United States has lost much of its rail manufacturing base. Since you now represent a Canadian rail company, and used to be President of an American one, please tell us how this happened, even

we have been funding Amtrak all these years and have focused attention on rebuilding the freight rail industry?

Answer. Although Bombardier, Inc. is a Canadian Company, it has many United States subsidiaries, as well as a vast manufacturing base in the United States. With respect to rail car manufacturing, while we do fabricate our new car shells in Canada, most of a car's assembly is performed in our rail car plant in Barre, Vermont. Moreover, we are planning to build a commuter/transit car manufacturing facility in Southern California if we are successful in winning a procurement for commuter and transit cars which the South County Railroad Authority and the Los Angeles County Transit Commission have under review. Additionally, we plan to construct a manufacturing maintenance facility in Texas which will provide a U.S. base to manufacture truly high speed rail equipment for the global market.

As you may also be aware, Bombardier, Inc. has a large aerospace division which includes the ownership of Learjet of Wichita, Kansas. With all of our various subsidiaries and U.S. operations, Bombardier and its subsidiaries employ over 4,000 U.S. employees.

While we acknowledge a Canadian ownership, for the foregoing reasons, we view ourselves as largely a U.S. manufacturer of rail cars. In fact, until our partner in the Texas TGV project, Morrison Knudsen, entered the passenger/transit car manufacturing business, Bombardier was the only U.S. manufacturer of rail cars for a 3 year period.

In terms of how the United States lost much of its rail car manufacturing base, I would refer in part to my testimony before the Subcommittee. I am not sure that I can succinctly state the reasons for the industry's demise, without getting into a lengthy dissertation, but among the reasons for its demise were:

1. *A Lack of an Orderly New Car Market.* Until the mid 1970's, the passenger/transit car market depended upon the U.S. freight railroads, and what are known as the "older" transit systems like New York, Boston, Chicago, Philadelphia. Most of those operations were conducted by private operators until the 1960's. Beginning in the 1960's, many of these companies were no longer able to make a profit from their operations and ceased investment in new equipment. This is especially true in the intercity passenger rail market where railroads stopped all new car investment and focused only on maintaining equipment on hand. With the transfer of these operations to public ownership, Amtrak, in the case of intercity rail service and municipal or regional public ownership in the case of transit services, the focus was on maintaining service, not new equipment. The reasons for this disinvestment were simple, the auto and highway mode was expanding exponentially due to demographics and suburbanization of our large cities. U.S. gasoline prices were and remain 30-40 percent of world prices, primarily due to investment and tax policy; and jet and regional commuter aircraft became the dominant transport mode for intercity travel beyond 250 miles. In fact, Amtrak was enacted by the U.S. Government in 1971 to relieve the private freight railroads of subsidizing rail passenger services they could not abandon due to the various state's public service rulings of the necessity of public convenience and necessity. Only over the past 10 years, under Graham Claytor's leadership, has Amtrak grown into a modern intercity passenger rail system.

2. *Foreign Subsidized Competition.* At the time America was abandoning development of high speed intercity passenger rail, as well as urban rail transit investment, Japan, France, Germany and the United Kingdom embarked on major developments. The Japanese developed the Shinkansen or bullet train that operates at 135 mph. British Rail developed rail service at 125 and France introduced the TGV at 165 mph in 1981. In 1989, the second generation TGV Atlantique was implemented and operates today at 186 mph and the third generation will operate at 200 mph plus. The German ICE was introduced in 1992 and operates at 155-160 mph. Also in the 1980's, 95-125 mph tilt-train technology was introduced and Bombardier's LRC, Fiat's ERT 450, ABB's X-2000 and Spain's Talgo. Bombardier's LRC and Spanish Talgo were successfully tested by Amtrak and the FRA in 1989 in the Northeast Corridor. More recently, the X-2000 has been tested. This technology is designed specifically to negotiate curves at higher speeds with reasonable passenger comfort.

Because of the lack of federal investment in the 1970's and 80's in rail transportation similar to federal investment in highways and aviation, American manufacturers abandoned or left the manufacturing industry due to a shrinking market and unfair subsidized foreign competition. This exit process was accelerated in the 1980's due to the highly overvalued U.S. dollar (250 yen/\$1, 3.40 DM/\$1, 10 f/\$1) which gave foreign manufacturers a 30-40 percent cost advantage just due to currency. Also, European and Japanese rail markets were closed to U.S. manufacturers yet the U.S. market had no barriers to entry. With foreign markets protected and unfavorable currency exchange rates, American manufacturers were at a competi-

tive disadvantage most could not overcome. Today, of the 20 largest U.S. based rail passenger equipment manufacturers, 16 are foreign owned. Even the Budd Company in the early 80's was owned by a German company.

3. *Custom Design of Transit Systems.* In the transit car industry, as new systems were developed in various cities, each system wanted their own system. The result was that many transit cars were designed around a system rather than a system designed around a "standard" transit car. The impact of providing a "custom" car to a transit property resulted in quick escalation of prices because the engineering and design costs of a car had to be amortized over the anticipated orders from the transit property. Again, because of price escalation, many subsidized foreign builders were able to offer lower prices.

LIABILITY ISSUES

Question 2. Both Mr. Claytor and Mr. Harper have testified that liability issues must be addressed before high-speed trains can operate on existing freight tracks. What is your view of the liability issue and how it should be resolved?

Answer. Liability is indeed a major consideration, particularly when rail options which would use the same track as existing freights are under consideration. The tilt train option, limited to average speeds of less than 100 mph in heavily traveled corridors, will have to co-use track. The history of the Virginia Railway Express gives example as to the position Class I railroads will take in allowing any high-speed rail operators to co-use their track without a full indemnification as they have required from Amtrak. In order for this option to be seriously pursued, government extended liability coverage will have to be available as it is today through Amtrak.

High-speed options which use dedicated and totally separate track, such as the 200 mph option the Texas TGV Corporation is developing in Texas, solve much of the problem by having their own track. Particularly in urban areas, they will co-use right of way—though with total separation—with existing freight operations. Here crash barriers and other means of physical protection should provide a sufficient basis for private insurers to fulfill the requirement.

TRAVEL TIME REDUCTION

Question 3. Mr. Vranich, Dr. Gran, and you have testified that an aspect of ensuring a successful high-speed system is reducing the intercity travel time in a corridor to compete with the downtown-to-downtown trip via commercial aviation. Please tell us more about this idea, and how you believe the incremental approach to corridor development fits this need as compared with maglev or other technologies?

Answer. As I stated in my testimony, there is a very appropriate role for the incremental approach to developing highspeed rail in the United States, but incremental improvement as the sole method of attempting to realize the economic and social benefits of high-speed rail investment should not be the only solution.

Perhaps the most fundamental aspect of current high-speed rail planning is that to be a worthy investment over the next twenty years it must provide an equal or better alternative to existing forms of transport AND it must compliment current and future investments in other forms of transport. Primarily, this translates into the requirement for at least equal travel times between cities served and equal or better prices. If travel times cannot be matched, then deep discounts must be offered which raises the specter of operating subsidies.

In the case where travel times are matched, the question of viability switches to operating and capital cost efficiencies vis-a-vis air. For cities between two hundred and three hundred miles apart, 200 mph trains can provide competitive travel times and can carry each passenger at $\frac{1}{4}$ to $\frac{1}{2}$ the cost of carrying the same passenger by air. The primary reason for this is larger vehicles which allow greater labor efficiencies and ground vehicles which have considerably lower energy usage. On the capital cost side, high-speed rail vehicles cost $\frac{1}{4}$ to $\frac{1}{2}$ the amount per seat as 737 model aircraft which fly in these 200-300 mile travel markets. Comparison on the infrastructure side is made difficult by no-cost federal grant aspects and the low borrowing costs the aviation and highway trust funds have afforded airport and airway facilities developers.

A loss of travel time competitiveness quickly dissolves these efficiencies. In the 1960's, it was the railroads' inability to remain time competitive with the airlines that has caused them to run at prices significantly below those of competing airlines, yet have market shares too low to provide an adequate return on their vehicles much less trust fund rates of return on infrastructure. It is for this reason that Amtrak was created.

Without grade separation and dedicated track, the incremental approach will be bound more by the slow speeds of vehicles with which they must share their tracks. With this handicap, the incremental approach may well suffer from the same profitability problems which have plagued the passenger rail industry since the early 1960's.

Maglev technologies once commercially viable can generate the operating speeds necessary to be competitive in the 200-300 mile routes—auto will dominate no matter what the speeds in routes of less than 100 miles and airline operating speeds of over 500 mph in level flight quickly erode the competitiveness of even 300 mph maglev vehicles. In time, maglev vehicles may have an operating history sufficient to be considered a realistic candidate for this major transportation segment.

A final consideration on travel time is how complimentary is the service with existing modes? In layman's terms, this means complimenting the investments and operations of competing modes—primarily airlines. A well known handicap of America's long haul airlines is the cost of feeding high volume hubs where their efficiencies can be maximized. If high speed rail can feed passengers in the same amount of time as the airlines can, then more efficient high speed rail operations can lower the feed costs to the long haul carriers. Volumes from the long haul carriers in turn increase the operating and capital efficiencies of high-speed rail operations. This is a highly complimentary way for the two industries to evolve, but as before, competitive travel times are an essential starting point for the analysis.

QUESTIONS ASKED BY SENATOR EXON AND ANSWERS THERETO BY MR. SALCI

FUNDING FOCUS

Question 1. Mr. Vranich testified that, given the limited federal funds available, "halfway" measures spread around numerous routes would be unjustified and could damage the concept of high-speed rail in the United States. Do you favor amending the bill to limit the number of corridors which could receive federal financial assistance?

Answer. As a general statement, I believe that there is agreement that there is insufficient funding in the Administration's proposal to "construct" a truly high-speed rail system. This leaves the Committee with a truly difficult choice of spreading funds around to a larger number of corridors or concentrate those efforts. I would suggest that federal funding efforts be limited to a smaller number of corridors which have a real prospect of attracting travelers to rail service from air or auto modes. Acknowledging my own bias, I think there are sound reasons to include funding for planning and feasibility efforts to construct a truly high-speed rail system of 200 mph, even if a condition for such planning support prohibits any federal funding for construction. By merely making incremental improvements to a large number of corridors at the same time, the result will be only marginal service improvement which will not affect traveler modal choice, while at the same time increasing long-term maintenance costs for the improvements rendered on the corridor. The potential result could be even higher operating subsidies to Amtrak on these corridors. On the other hand, concentrating funding to a limited number of corridors will give Amtrak or a provider of truly high-speed service an opportunity to reap the benefits of this investment and result in significantly affecting modal choice to rail as opposed to air or auto and thus genuinely reducing corridor congestion.

AIRLINE COMPETITION

Question 2. In testimony for the record, the Government Accounting Office (GAO) warned that airlines may react to new high-speed rail systems with steep discounting. What are your thoughts on such a prospect, and do you realistically see our troubled airline industry working with, or even being operators, of high-speed rail routes instead of competing?

Answer. In a competitive market place, prices will move for both tactical and strategic reasons. If high-speed rail directly competes and attempts to do so by discount pricing, I would not be surprised if airlines did not attempt to follow suit. Conversely, airlines might try to predatorily drop prices to force the rail operator into bankruptcy. This, however, is not a viable long-term strategy for an airline to follow.

The best high-speed rail systems will be ones which can compete on travel time, such that they can set up complimentary operations with the long haul air carriers. High-speed rail systems have capital efficiencies which increase as volume increases—a factor which the airlines do not enjoy, so over the long haul, travel prices

can come down. It is not, however, in the best interests of either high-speed rail operators or the airlines to try to force each other out of business with extremely low fares.

ATTRACTING PRIVATE FUNDS

Question 3. You testified that S. 839 as introduced would specifically prohibit counting previously invested private funds as part of the state or local matching requirements for federal funding. Could you please explain in more detail how this might be a problem and how you would propose to amend the bill to resolve this issue?

Answer. Section 2 of S. 839 proposes a new title to the Railroad Revitalization and Regulatory Reform Act of 1976 which is "TITLE X High Speed Rail Assistance." Section 1005(c) of this title "exclude(s) any payments or contribution to State and/or local governments or authorities from holders of a franchise or other private parties with an interest in the development or operation of the high-speed rail system." Given the level of detail of this exclusion it is clear that it was solely designed to prevent the Texas TGV project from participating in this program since there is no other viable high-speed rail development project today which utilizes a franchise. We would assert that preventing the use of private funds to serve as the state or local match is antithetical to federal policies already established for competing modes.

Private funds are eligible to qualify as state match funds in every other transportation solution, highway, transit or airport. Provisions of ISTEA and Federal Transit Administration regulations provide such eligibility to highway and transit alternatives. Section 511(a)(12) of the Airport and Airway Improvement Act of 1982 which requires that "all revenues generated by [an] airport (including concessions or franchise fees from a concessionaire or other businesses located on the airport) must be expended for capital or operating costs of the airport, the local airport system or other facilities substantially related to the actual air transportation of passengers or property." All airport operators use these private revenues generated by the airport as match funds for airport improvement projects under the FAA AIP program and match funds for formula allocations.

Thus, in considering transportation improvements in a planning process, all other considerations being equal, state and local officials are more likely to select a transportation improvement where the state or local financial investment can be off-set in some way. While this off-set is available for highway, transit and aviation alternatives, it is not available for high-speed rail, which will lead to an objective bias against high-speed rail solutions.

Given the policies already in place for other modes, we believe that the success of federal investment in high-speed rail will hinge on the private sector being encouraged to play the same role as it plays in highway aviation.

We would, therefore, propose that the legislation be modified by specifically "including" payment or contribution by private entities to a state or local government or authority being eligible to serve as a state or local match for funds under the program.

CORRIDOR COSTS

Question 4. In testimony for the record, GAO asserted that costs for a hypothetical 200-mile corridor could be as much as \$2.6 billion for incremental high-speed rail, \$4 billion for a TGV-type system, and as much as \$12 billion or \$60 million per mile, for a maglev system. What is your response to these cost estimates?

Answer. As noted in the earlier discussion, the efficiencies of incremental high-speed rail may be illusory. Train speeds in any corridor will be determined by four factors other than the use of high-speed train sets. These factors are grade crossings, signal systems, track structure and right-of-way curvature. Assuming the use of tilt-type technology which would allow for 150 mph maximum travel speeds, virtually all grade crossings along a given corridor would need to be closed. A significant cost. Second, automatic cab signals would be required. Third, track structure would need improvements at least to the level of the Northeast Corridor which is now virtually devoid of freight traffic and the 25-30 ton axle loadings on the track. These are substantial costs. Once a decision is made to grade separate and dedicate track to allow the tilt vehicles to operate at their maximum speeds, one might as well operate higher speed vehicles on those same tracks. One place where tilt vehicles will have a role in the long run are corridors which are simply too congested to dramatically straighten the right-of-way, such as the Northeast corridor where grade separation and track dedication have already been achieved by prior federal expenditures.

As to maglev costs, these remain highly volatile as there really is no realistic basis for establishing a cost. They do appear to be the most expensive of all options as they cannot operate on low cost ballasted track at any point of their operations.

QUESTIONS ASKED BY SENATOR DANFORTH AND ANSWERS THERETO BY MR. SALCI

Question 1. What "gap" would high-speed passenger rail service fill within the existing transportation system? Could the same need be filled in other ways? At the least cost?

Answer. The question is not so much what gap will be filled, but if travel in congested transportation corridors is eased by a dollar of investment in high-speed rail facilities or in more highways or airports. Over the next twenty years, it seems evident that dollars spent in these other modes will have reached a level of diminishing returns especially in congested corridors.

If I could, I would slightly rephrase the question as follows: What role would high-speed rail play in relieving travel congestion in certain corridors? The response is one of introducing a new competitive mode which will facilitate smoother travel on all modes which operate in a given corridor. By offering a cost competitive alternative to highway and air modes, a high-speed rail investment not only reduces stress on existing transportation facilities but it will also be complimentary and add additional passenger capacity between two points. High-speed rail dollars—precisely because they are spent in a different area—are ones where returns which will increase over time because of the economies of scale which only high-speed rail can bring to congested corridors.

Question 2. Does an incremental increase in train speeds up to 150 miles per hour make enough difference in travel time to justify spending \$1.3 billion?

Answer. To be sure, there is a very appropriate role for incrementally improving certain specific corridors across the nation, but incremental improvement as the sole method of attempting to realize the economic and social benefits of high speed rail investment should not be the only solution.

The fundamental factor in determining whether or not high speed rail will be successful in a particular corridor is, first and foremost, sufficient passenger traffic flow between the terminal points of the corridor. Without this basic element, no amount of investment will result in successful high speed operation. The critical factor in successfully implementing high speed rail is not the distance between two points, but the TRAVEL TIME between traveler destinations by competing modes of transportation.

The point here is that making incremental improvements in rail corridors where those improvements do not result in train service that competes with air and auto alternatives in that corridor will improve ridership only marginally, if at all.

I make this assessment somewhat gingerly because a very important customer of my company, Amtrak, would be the beneficiary of these improvements. But I've known Graham Claytor a long time, and I think he would agree with this assessment.

Using the Houston-Dallas corridor as an example, schedule travel time from "downtown to downtown" by air is approximately 172 minutes, by car 256 minutes. To be a cost effective alternative to both car and air travel, high speed rail improvements will have to provide service equivalent to the 172 minute travel time which air service offers. Evidence of the assessment can be demonstrated even better in the Northeast Corridor where Amtrak service between downtown Washington, D.C. and downtown New York City is equivalent, or many times below, the same travel time by air. This is the driving reason why Amtrak carries more passengers than either of the two air shuttle operators.

Having explored some of the issues associated with incremental high speed rail improvements, I would like to focus on the issue of whether or not the federal government should actively promote the development of very high speed rail corridors.

Recognizing that I am not a disinterested party in the Texas High Speed Rail Project, I believe that there are very discreet corridors that are not only appropriate, but highly preferable routes to develop and implement a fully grade separated, dedicated right-of-way high speed rail system capable of operating at sustained speeds of 200-250 mph. Understanding the federal budgeting situation our nation faces, I am not at all suggesting that S. 839 be used to fund the construction of the Texas TGV Project or a project similar to it. There is simply not enough money.

Quite the contrary, in Texas we propose to fund the construction, operation and maintenance of this project through the private capital markets. Therefore, the appropriate federal role should be in providing sufficient federal assistance to leverage private funds to build these dedicated right-of-way projects.

Question 3. What is the job creation potential of this legislation?

Answer. I do not think I am fully qualified to offer an accurate assessment of the job creation potential of this legislation. I can estimate that with respect to a single high-speed rail project I am involved with, the Texas TGV Project, we are estimating that construction of the system will create 30,000 direct and indirect jobs during its construction phase and newly 10,000 direct and indirect jobs once the system is operational.

Question 4. How many high-speed rail corridors would the market justify between cities not served by other passenger transportation modes?

Answer. None. In fact, if there is currently no other mode of competing transportation between two cities there is no reason to believe the market will justify high-speed rail service. High-speed rail, just like air service or bus service will require a threshold of travel density to justify service. If air or bus services is not currently provided between two cities, there are not likely to be any justification for high-speed rail.

ANSWERS BY DR. GRAN TO QUESTIONS ASKED BY SENATOR HOLLINGS

MAGLEV

Answer 1. Most of the developers of maglev systems believe that an orderly development of a maglev design requires significant testing of subsystems and components—including the guideway—to prove that their system will work reliably and safely. This is standard engineering practice. For this reason, we believe that the maglev prototype program as outlined in ISTEA is the proper way to develop the system, and there should be no fundamental change in ISTEA. The proposal to fund maglev over the next five years—a longer time than outlined in ISTEA—means that less money will be available for industry. As a consequence, any dilution of the funding for a test facility would be counter-productive, unless a test site for one or more of the designs was placed in an area where the post test segment could be part of a revenue system. Funding a test track anywhere else would be wasteful of taxpayer revenue and would be viewed by industry as less desirable since it would escalate their costs and minimize the possibility of follow on revenue.

TRAVEL TIME

Answer 2. Incremental improvement in rail speed, while a step in the direction of improving inter-city travel time, does not produce reductions in trip times sufficient to induce significant numbers of travelers to switch from other modes to rail. The AMTRAK improvements in the Northeast corridor will cut travel time by only 20 minutes for trips from Washington to New York. The costs of the incremental improvements to achieve this, were they to be paid for by the passengers, would make these improvements uneconomical. In addition, it is inevitable that the speed of trains will reach a point where the next increment will be far more expensive than maglev. To achieve higher speeds, steel wheel technology requires that all grade crossings be eliminated and that significant parts of the system be elevated. When this happens the cost of the system escalates rapidly. Maglev has been designed to be elevated over existing highways. This is possible because a maglev vehicle weighs significantly less than a steel wheel vehicle. Thus incremental improvements in steel wheel may be cost effective now, but in the long run they will not achieve the required point to point reduction in travel time.

Maglev can operate at peak speeds of 300 mph and with average speeds of 230 mph. It operates on elevated guideways. It has been designed for safety, and it has very low operating costs. For these reasons, maglev will dramatically reduce travel time. Steel wheel, on the other hand, will require expensive maintenance to even go 200 mph. Railroads can only operate safely at these speeds if grade crossings are eliminated and the track is elevated in many areas.

FOREIGN THREAT IN MAGLEV

Answer 3. The simple reason that the Japanese and German maglevs have not yet penetrated American markets is that their technology is too expensive. In the Maglev Technology Advisory Committee report, we pointed out that the Japanese and Germans were designing systems for use in corridors that require tunnels and bridges that far exceed what would be required in America. In addition, it is not uncommon for a transit system in Japan to have over 100,000 riders per week—a number that no American market currently can provide because the cost of fuel in America has been maintained at artificially low levels. The result was a set of system designs that are good in their countries, but are too expensive for America.

The Japanese and Germans are not dumb. They know that to sell their systems they must reduce the costs. While we are arguing about whether or not to develop maglev at all, they are redesigning for the American market. If we don't act now we may be too late. My company stands ready to do what has to be done to win this race, and has already committed more of its own funds than has been received in contracts.

ANSWERS BY DR. GRAN TO QUESTIONS BY SENATOR EXON

AIRLINE COMPETITION

Answer 1. Based on an analysis of airline operation done by Larry Johnson of Argonne National Laboratories, we believe that a maglev system that connects in an intermodal way with airports would complement airport operations. The concept is very simple. Since maglev uses much less energy for short haul operations, the interconnectivity would relieve air carriers from providing short haul service. The short-haul flights that would be eliminated by maglev service would free landing slots and reduce take-off and landing delays. The additional slots would be used for long-haul flights that are more efficient and consume less energy. This would relieve pressure for both new airports and for dramatic overhaul of the FAA traffic control system. This operational concept also creates the possibility of airline ownership or operation of maglev lines.

If an airline that operates in one of the maglev markets didn't accept the above premise, and chooses to compete by attempting to drive out the maglev, they would be at a significant disadvantage. The marginal costs are significantly higher for aircraft. Maglev energy costs are projected to be less than 4 cents a passenger mile compared to over 40 cents for short haul flights. In addition, time and weather are on the side of maglev. One inducement for passenger use of a maglev is its insensitivity to weather delays and cancellations. This will make maglev safer, and more reliable than air travel. Airline competitors will not be able to sustain a price war for any length of time under these conditions.

CORRIDOR COSTS

Answer 2. The GAO testimony that describes maglev costs as \$60 million per mile is based on data from an old Transportation Research Board Study did over three years ago. At then the only data available for maglev costs was for the German and Japanese maglevs. Since then the National Maglev Initiative (NMI) System Concept Definition (SCD) studies have been completed and we have some American maglev concept guideway costs. The four designs have guideway costs that range from a low of \$19.5 million per mile to a high of \$24 million per mile. The GAO needs to look carefully at these costs and revise their statement because the costs have been verified.

One of the questions often asked of industry is, "How can you be so confident that the costs per mile you are quoting are correct?" To answer this question there are two facts that must be kept in mind. First, the dominant cost in maglev is construction. Seventy-two percent of the total cost of a maglev system is the guideway and the ancillary facilities (stations etc.). The vehicles only amount to 13 percent of the total cost. Second, the pricing of concrete and construction is a well-developed science.

These facts mean that even if the vehicle costs in a maglev doubled (a very unlikely scenario), the total cost per mile of the maglev system would only increase by about 11 percent—for example, from \$19.5 million per mile to \$22 million per mile for Grumman's design. This is well within the contingency of 20 percent that is built into the guideway per mile cost estimates that we have developed. Thus our confidence in the maglev per mile costs are based on very reasonable cost models. Additionally, the DOT and the Corps of Engineers have done an independent analysis of all the cost models developed by the four NMI contractors, and they have confirmed the numbers.

The last point raised by this question concerns the cost of high speed rail—and in particular TGV. The best speed that these systems achieve is about 150 to 170 miles per hour. The maglev systems developed under the NMI will be capable of 300 miles per hour, and at \$20 million per mile, the 200 mile corridor would cost \$4 billion, the same as TGV. The TGV is at grade level, and the maglev would be elevated over its entire route above highways. Thus maglev could achieve twice the speed of the TGV at roughly the same cost. I might also note that a true high speed rail system like TGV requires a separate, dedicated right-of-way and could not be collocated on an existing right-of-way. Industry is asking for the opportunity to

prove the viability of maglev through the provisions of the ISTEA maglev prototype development program.

ANSWERS BY DR. GRAN TO QUESTIONS ASKED BY SENATOR DANFORTH

THE GAP THAT HIGH SPEED RAIL WOULD FILL

Answer 1. There is a need for improved high speed transportation that is more energy efficient and gets people from home to destination in as short a time as possible. Aircraft are fuel inefficient and subject to frequent delays. Both air traffic and weather delays increase the time needed to travel from point to point on aircraft. The "gap" that a maglev system can fill is not a gap but rather the reduction in air traffic delays. The gridlock in the air costs this country conservatively \$5 billion per year with expectations to increase significantly in the near future. Since landing and take-off delays are a significant percentage of the total time that a person is traveling when the trip is for 500 miles or less, replacing these inefficient flights with a maglev system will alleviate congestion, offer comparable travel time and provide more slots for long flights. High speed rail, incrementally installed would begin to fill that gap, but there is a limit to the amount of incremental improvements that will be possible. As discussed in the answer to Senator Hollings question 2, maglev is required to achieve cost effective high speed travel in this "gap" market.

WILL INCREMENTAL SPEED INCREASES IMPROVE TRAVEL TIME ENOUGH TO JUSTIFY THE COST

Answer 2. No. The costs for incremental improvements would never be recovered by the increased passenger volume.

WHAT IS THE JOB CREATION POTENTIAL

Answer 3. An industry rule of thumb is that for every \$1 billion spent on construction about 20,000 jobs are created.

HOW MANY HIGH SPEED RAIL CORRIDORS NOT SERVED BY OTHER PASSENGER TRANSPORTATION MODES WOULD THE MARKET JUSTIFY

Answer 4. None. If the criterion is that a high speed rail system, when inserted in a market, has to pay its costs from the passenger revenue, then no new corridors are justified.

QUESTIONS ASKED BY SENATOR HOLLINGS AND ANSWERS THERETO BY MR. BUCHANAN

FOREIGN TECHNOLOGY

Question 1. Some of the high-speed rail systems which have been proposed would use foreign technology, although it has been suggested that the trains might be assembled in the United States. What is rail labor's position on this issue?

Answer. Because of the absence of U.S. technological development in the rail passenger area following World War II and almost to date, it may well be necessary to utilize foreign technology in this field. However, rail labor would much prefer that the manufacture as well as assembly of all components of high speed rail passenger equipment be performed in the U.S. on license from the owners of the patents on the equipment. If that is not possible, then as much of the manufacture and assembly as can be done in the U.S. should be required to be done in the U.S.

ADEQUACY OF ADMINISTRATION'S PROPOSAL

Question 2. Do you believe that the Administration's high-speed rail proposal offers sufficient funding, structured in an appropriate manner, to lead to corridor construction or high-speed improvements?

Answer. I believe the operative term in your question is "to lead". I don't think the ending is sufficient to do more than to begin a process which, with the appropriate federal and local support and development, will eventually accomplish the development of many high-speed rail corridors. But given our fiscal and budgetary problems I believe it provides an excellent start in the right direction. The structuring of the funding is complicated but because of its stress on local participation I believe it works because it almost guarantees the commitment of the local communities at the outset.

QUESTIONS ASKED BY SENATOR EXON AND ANSWERS THERETO BY MR. BUCHANAN

RAIL PASSENGER SERVICE ACT

Question 1. Mr. Harper testified that the legislation should be amended to make clear that the Rail Passenger Service Act should not apply to new high-speed services under this program if Amtrak is an operator in a corridor, so that any operating agreement with a freight railroad would be at arms length. What is your response to Mr. Harper's proposal.

Answer. I must disagree with Mr. Harper. I believe an "arm's length" negotiation with a railroad regarding the use of one of its lines would result in a highly expensive proposition for the corridor applicant (the public) and perhaps unnecessarily profitable for the railroad. I much prefer the existing situation under Section 402 of the Rail Passenger Service Act which authorizes the ICC to set a price that is fair to both parties if the parties cannot agree voluntarily.

AMTRAK'S ROLE

Question 2. The Committee heard testimony that the role of operator of these projects should specifically be opened to competition, whether it be Amtrak or another entity such as an airline. What is your view on this issue, and should the bill be amended to reflect this?

Answer. Our view is that Amtrak—with all its warts when perceived from rail labor's perspective—is the logical party to operate high speed intercity rail passenger service. It now operates such service between Washington and New York. It is national in its operation and currently operates over most of the lines which would become high speed lines. Amtrak is also scrutinized annually by Congress. Rail Labor would not object to the bill's amendment to reflect Congress choice of Amtrak as operator.

RAIL LABOR

Question 3. Given all of the difficulties and calls for change in our rail labor laws after the strike/lockout last year, do you believe that revisiting some of the rail labor and safety laws for a new era of high-speed rail would be appropriate? What about the maglev?

Answer. The Brown-Reich Commission may take up the Railway Labor Act in its review of our nations labor laws and if it does I believe the problems which arose last year in connection with the railroads' nationwide lockout upon a strike by one union against one railroad can be addressed. I do not think that the entry of high speed passenger service into the rail industry should, or will, affect the conduct of labor relations in that industry. I believe that intercity high speed railroad passenger service, whether performed by a steel wheel on a steel rail or by magnetic levitation immediately contiguous to a steel rail, is railroad service and should be subject to all of labor and safety laws now applicable to such service.

QUESTIONS ASKED BY SENATOR HOLLINGS AND ANSWERS THERETO BY MR. VRANICH

Question 1. Focus of investment.

Answer. High-speed ground transportation is a national need to the degree that it can be employed effectively to increase mobility in our nation's most congested travel corridors. Numerous benefits will come to the American public generally as high-speed trains help eliminate congestion at our nation's busiest airports and along our busiest highways; as transportation safety is enhanced; and as we rely on energy efficient trains to reduce our terrible dependence on foreign oil. Selection of appropriate corridors can be made only through a thoughtful process whereby the extent of state, local and private financial resources is taken into account in a way that will maximize any Federal investment. It is too early to tell the number of corridors that may be assisted by such a process. Nevertheless, we are concerned, as expressed in our testimony, that high-speed rail improvement projects be approved only if part of a well-developed master plan. Otherwise, improvements could be made to rail lines in the name of high-speed rail—improvements that in fact are inadequate to bringing about effective high-speed rail services.

Question 2. Readiness to proceed.

Answer. Further corridor designations should come from state or regional planning agencies that are committed to help finance the development of such corridors. Designations without financial commitments amount to superficial activity. Enough studies have been conducted regarding both steel-wheel and maglev high-speed systems. It is time to begin building. The technologies are not the problem; it is the

institutional roadblocks that are the problem. Regarding steel-wheel systems, there is no good reason why, after appropriate environmental considerations are taken into account, that such proven systems cannot be under construction. Regarding maglev, the nation should be pursuing a maglev prototype program in conjunction with industry. The amount of funding requested for the entire program is less than is routinely granted annually to NASA and other agencies for aeronautical development.

Question 3. Funding focus.

Answer. It does not appear necessary at this time to limit the number of corridors that could receive funding assistance. The extent of federal involvement can better be determined after applications for grants have been received by the Secretary of Transportation.

Question 4. Travel time.

Answer. There is no one answer as to how to best link cities in a competitive manner with aviation. In some cases, tilt-train technology over upgraded rail lines presents a solution; in other cases all-new steel-wheel or maglev lines are the answer. The technology best suited to terrain and infrastructure considerations will vary from one corridor to another.

Question 5. Airline competition.

Answer. Every indication is that airport and airway congestion will increase in future years. Evidence is mounting that foreign airlines (e.g., Japan Air Lines, Lufthansa, Alitalia, KLM) are increasingly supportive of using high-speed trains to alleviate aviation congestion. Such a shift also is beginning to appear in North America as CP Air considers joining a high-speed rail consortium that would build a Montreal-Toronto line and USAir has become an equity partner in the Pittsburgh Maglev Incorporated high-speed train project. It is quite possible, some say inevitable, that airlines will operate selected high-speed trains in the future.

Question 6. Corridor costs.

Answer. The GAO estimates are reasonable only if it is assumed that all technological process has stopped. It is possible for high-speed systems to be built at lower costs as new cost-saving and lighter-weight technologies are designed. Specifically, the \$60 million cost per mile figure for maglev is based on a specialized Japanese design that will never be built in the United States and thus is misleading.

Question 7. High speed rail filling a gap.

Answer. It is clear that new airports will not be built in congested cities such as Chicago and that an unrestrained expansion of our highway system in environmentally sensitive areas will no longer be acceptable. High-speed rail presents a viable option to providing increased transport capacity in such situations. It is doubtful that new super-airports and interstate highways could be constructed at lower costs levels.

Question 8. Can 150 mph justify spending \$1.3 billion?

Answer. Yes, particularly in an era where one new airport proposed for Chicago could cost as much as \$17.5 billion and one new 7-mile highway in Boston is costing \$5.8 billion—all in tax dollars.

Question 9. Job creating potential.

Answer. Numerous states have conducted studies of the job creating potential of high-speed rail and have concluded that construction of such systems could create tens of thousands of new jobs. Studies particularly in Pennsylvania, Ohio, Florida, California and Texas provide considerable information regarding this point.

Question 10. How many corridors.

Answer. This question presumes that the nation can afford an unrestrained expansion of the highway and aviation modes, containing sufficient illogic as to make a response difficult.

QUESTIONS ASKED BY SENATOR HOLLINGS AND ANSWERS THERETO BY MR. PEÑA

FUNDING SUFFICIENCY

Question 1. The Administration's proposed request of \$1.3 billion represents a substantial federal commitment to high-speed ground transportation. Yet, Mr. Claytor of Amtrak testified that the amount available for capital will "not handle more than a modest fraction of the infrastructure improvement costs in one corridor" unless other sources are developed. In testimony submitted for the record, the General Accounting Office commented that the costs for incremental improvements in just one hypothetical 200-mile corridor could range from \$500 million to \$2.6 billion. How do you respond to these assertions? With state, local and private-sector contributions, what high-speed improvements, beyond the plans, can we expect?

Answer. The program places a heavy emphasis on State/local/private partnerships to initiate and share in the development of high-speed rail projects. Under this program, corridors will be competing for the available program funding and the most important evaluation criteria will be the transportation improvement to be realized from the program investment.

Our goal is to improve intercity transportation, to raise peak speeds to greater than 125 miles per hour, and to significantly reduce intercity trip times. The program is designed to expand the impact of the program funds by requiring State, local and private investment. The \$1.3 billion authorization request includes \$982 million for the program to assist development of high-speed corridors. We expect that \$982 million will leverage a total high-speed rail infrastructure investment of up to \$2.5 billion. This investment will go beyond "paper studies" and plans to the construction of track, signal systems, stations and the other infrastructure necessary for high-speed service. Using GAO's estimates, this level of investment will result in significant transportation improvements in one to five corridors.

The available funding may require us to focus on one or two corridors to achieve the program's goals or may permit us to fund multiple corridors. The unknown factor is the level of State, local and private financial commitment to specific corridors.

For that reason, it is premature to say how many corridors will be funded and what accomplishments are achieved. We want to give the States the opportunity to demonstrate the commitments to developing a specific corridor before we make those decisions.

CORRIDOR FUNDING

Question 2. Within the \$982 million requested for corridor assistance, have you anticipated how much will be budgeted for the designation process, for the master plans, and for the corridor financing agreements? Out of the \$982 million requested, how much will be available to build high-speed systems or pay for improvements?

Answer. Until we learn the number, quality, and substance of the State petitions for corridor designation, and the financing packages developed by our State, local, and private partnerships, we cannot predict the number of corridors that will be designated or the number and complexity of corridor master plans that will be funded. Of course, we hope to maximize the amount that actually supports construction of the high-speed systems, to the extent permitted by sound planning practices.

PROGRAM GOALS

Question 3. At the hearing, testimony was presented that reducing total trip time, not top speed, is the key to attracting riders in a successful system. One witness testified that several of the incremental high-speed rail programs will barely equal, in terms of trip time, the travel time of nearly 25 years ago when the railroads divested their passenger service. How do you respond to these comments? To what extent can DOT ensure that the United States promotes high-speed rail projects that reduce trip times enough to attract a sufficient number of riders and alleviate congestion?

Answer. Our program looks to the future. Each corridor will need to be justified on the costs and benefits associated with the proposed improvements. If the State's plans include travel times insufficient to generate adequate ridership and revenues for future operations, then the corridor would rank relatively poorly on certain criteria in our legislative proposal. DOT's evaluations, based on these criteria, will assure that the accepted proposals include perceptible transportation improvements in the corridors in question.

MAGLEV

Question 4. Given maglev's potential to change the nature of our transportation system in the next century, how does the Administration see investment in maglev as compared with spending on incremental high-speed rail?

Answer. I see these investments as part of a comprehensive approach to the development of improved high-speed ground transportation in this country. Maglev has the potential to change the nature of our transportation system in the next century, and we need to invest in research and development to determine whether maglev's potential can be realized at a reasonable cost. At the same time, we currently have transportation needs that can be met by investments in high-speed rail infrastructure today.

Question 5. Under the current proposal of \$228 million over five years for maglev, will actual sub-scale hardware be constructed?

Answer. Yes. The Department's proposed modifications to the maglev development plan in ISTEA increased the time period of the phase one and phase two con-

tracts specifically to afford greater opportunity for testing scale models of systems and full scale testing of system components. This will provide the Department with a better basis to judge the technical and economic aspects or competing designs.

Question 6. When will the National Maglev Initiative (NMI) report be released? When will DOT release the underlying technical reports, including the NMI broad agency announcements and the system concept designs? Given the NMI report, is there need for further commercial feasibility studies?

Answer. We intend to issue the NMI report in August. Virtually all of the reports resulting from the NMI broad agency announcements have been published and can be obtained from the National Technical Information Service (NTIS). With regard to the system concept definitions, the NMI has also published a summary report of the information submitted by the contractors, and this too is available from NTIS. Because of the proprietary nature of the contractor submittals, the NMI does not plan to publish these.

The Department of Transportation believes that a full understanding of the commercial feasibility of high-speed ground transportation requires further study that includes more modest improvements along with the very high-speed alternatives considered in the NMI. This approach will afford potential project sponsors a full range of options to consider. Such a study is mandated by ISTEA and is due in Congress in June of 1995, but we plan to conduct it in a year. The NMI economic studies left some unanswered questions (for example, there is room for further analysis of public benefits and refinement of some of the cost estimation).

QUESTIONS ASKED BY SENATOR EXON AND ANSWERS THERETO BY MR. PEÑA

AMTRAK/FREIGHT RAILROAD RELATIONSHIP

Question 1. Mr. Harper testified that the legislation should be amended to make clear that the contractual and operating agreement provisions of the Rail Passenger Service Act should not apply to new high-speed services under this program, if Amtrak is the chosen operator in a corridor. What is your response to this assertion?

Answer. I disagree with it. Under the Rail Passenger Service Act, the United States relieved freight railroads of their common carrier obligations to provide intercity rail passenger service upon contracting with Amtrak to provide that service instead. Part of contracting with Amtrak to provide the service, as required by section 402(a) of the Rail Passenger Service Act, is giving Amtrak access to the railroads' lines and other facilities, subject to a determination of fair and equitable compensation by the ICC if the parties cannot agree. Section 402(f) permits Amtrak to seek an order from the Secretary of Transportation setting maximum permissible speeds if a railroad refuses to permit accelerated speeds by Amtrak trains.

Section 402 is the only existing way to assure that high-speed rail service can be provided over the lines of a freight railroad. A freight railroad is otherwise free to refuse to permit high-speed rail passenger service to be operated over its property. That is reason enough for section 402 to continue to apply to high-speed rail service funded under the Administration's high-speed rail proposal.

Moreover, any change in the relationship between the freight railroads and Amtrak, as established by the Rail Passenger Service Act, could have significant implications for the future of intercity rail passenger service in this country. Proposals for such changes should be addressed as part of a comprehensive debate over the role of Amtrak in the Nation's transportation system. That debate can best be conducted in the context of the reauthorization of the Rail Passenger Service Act, which is scheduled for next year.

BUY AMERICA

Question 2. I understand that the Administration originally intended to include "Buy America" provisions in the legislation. What is the status of that language? How can we learn from the Chicago and Los Angeles mass transit experience to ensure that high-speed rail manufacturing creates American jobs?

Answer. The Administration has no objection to the buy America requirement included in H.R. 1919 (as ordered reported), which has overtaken the Administration proposal.

With regard to lessons learned about preserving or creating manufacturing jobs in the high-speed rail sector, a number of points need to be kept in mind. First, there needs to be a sufficiently large domestic market for high-speed rail products for industry to commit the resources necessary to develop world class high-speed rail technologies. Second, we need to provide financial assistance at the Federal level to supplement industry's resources to overcome the years of neglect in develop-

ment of advanced passenger rail technologies. And, third we need to encourage the consideration by high-speed rail system developers of the products of American manufacturers, with the incorporation of the "Buy America" provision presented above, the proposed legislation will address all of these needs.

QUESTIONS ASKED BY SENATOR DANFORTH AND ANSWERS THERETO BY MR. PEÑA

Question 1. What "gap" would high-speed passenger rail service fill within the existing transportation system? Could the same need be filled in other ways? At the least cost?

Answer. High-speed rail service would primarily address the short-haul intercity travel market, for trips on the order of 100 to 500 miles. In that range, congestion on roads in metropolitan areas and at airports imposes severe time and reliability penalties on the automobile and air modes. High-speed rail, with its independent, all-weather access to the hearts of our major cities and to strategically located suburban stations, can often provide the fastest travel times available by any mode in important short-haul travel markets.

To provide equivalent trip times and reliability by the automobile or air modes would require significant additional capacity. For auto, separation of intercity traffic from the local traffic that accounts for most congestion would be impracticable for air, provision of additional airport capacity has become increasingly difficult due to environmental and cost considerations.

Therefore, in many markets, high-speed rail offers the most cost-effective approach to preserving or improving mobility in the face of growing travel demand.

Question 2. Does an incremental increase in train speeds up to 150 miles per hour make enough difference in travel time to justify spending \$1.3 billion?

Answer. The precise increase in train speeds will vary significantly from one corridor to another, and from location to location within each corridor. The cost effectiveness of a speed increase over a particular corridor segment will depend on a host of factors including rolling stock specifications, fixed plant improvements, length of the higher-speed segment, and opportunity cost in terms of other obtainable time reductions foregone. The corridor master plans—which the draft legislation requires, and which we will carefully scrutinize—will thoroughly address these important technical details.

Question 3. Is it true that the new high-speed rail corridors established under this legislation would not necessarily involve Amtrak?

Answer. Under our proposed legislation, Amtrak would be involved in any high-speed rail services that develop over intercity routes that it currently serves. Section 401(c) of the Rail Passenger Services Act (45 U.S.C. 561) provides that "no railroad or any other person may, without the consent of the (National Railroad Passenger) Corporation, conduct intercity rail passenger service over any route over which the Corporation is performing scheduled intercity rail passenger pursuant to a contract under the section." The Department does not propose to change this provision.

High-speed rail services that develop over routes not presently served by Amtrak would not necessarily involve Amtrak. It would be the responsibility of the State sponsor of the high-speed service to identify the proposed operator. Amtrak would, of course, be a strong competitor to operate these systems as well given Amtrak's statutory access to freight rail lines nationwide and its statutory exemption from Federal and State economic regulation.

Question 4. How many corridors do you plan to fund with this legislation? Do you intend for them to operate without further Federal subsidy?

Answer. Until we see the applications for corridor designation, and assess the extent of State, local, and private commitment to this program, we cannot specify how many corridors will be funded. The legislation would prohibit any Federal subsidy of operating and maintenance expenses occasioned by the upgrade in service under this program.

Question 5. Could high-speed rail service established by this legislation compete with Amtrak service? Existing bus lines? Existing airlines?

Answer. The Department's goal is to incorporate high-speed rail into a coordinated intermodal transportation system where the various modes are complementary, not engaged in ruinous competition.

With regard to the specific questions, Amtrak's exclusive franchise identified in response to question 3 above would prevent high-speed rail service being developed in competition with an existing Amtrak service.

I don't expect that there would be any significant amount of competition between new high-speed rail systems and existing intercity bus lines. These two forms of transportation are intended to serve different segments of the transportation mar-

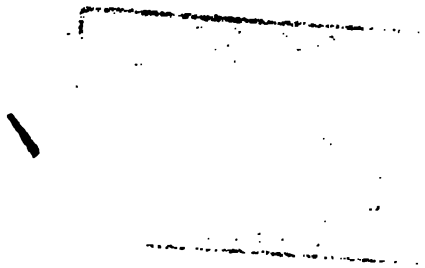
ket. Intercity bus serves those travelers who base their modal choice primarily on cost and not time sensitivity. High-speed rail, on the other hand, will be a more expensive service designed to attract travelers that are time-sensitive.

It is possible that, in some limited markets, high-speed rail would compete with some short haul air trips. However, the Department believes that high-speed rail will more likely become a feeder for airlines—freeing the airports and airlines assets to serve the longer distance, more profitable routes.

Question 6. Should the federal government subsidize one passenger transportation mode at the expense of others?

Answer. As indicated in question 5 above, we regard high-speed rail as complementing the other modes in a seamless, intermodal fabric. Moreover, the proposal is not for an operating subsidy for high-speed train operations and maintenance, but for an investment in infrastructure in partnership with States, localities, and the private sector. Thus, rather than viewing this program as subsidizing one mode at the expense of another, we view it as a collaborative effort in which our funds catalyze a major transportation improvement with benefits across the modal spectrum.

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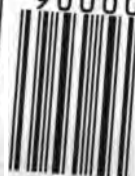
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